7300 Water Supply Section

7301 Regulations Governing the Construction and Use of Wells

Adopted: Effective: ~~February 6, 1997~~ April 6, 1997

1.0 General Provisions

1.1 Statutory Authority

The Secretary of the Department of Natural Resources and Environmental Control (Department) establishes and adopts the following Regulations under and pursuant to the authority granted by Sections 6003 and Chapter 6010~~(a)~~ of Chapter 60 of Title 7 of the Delaware Code.~~the Delaware Environmental Protection Act, 7 *Del.C.* Chapter 60.~~

1.2 Scope and Applicability

1.2.1 Minimum requirements are hereby prescribed governing the location, design, installation, use, disinfection, modification, repair, and ~~abandonment~~ sealing of all wells and associated pumping equipment as well as prescribing certain requirements for the protection of public and private potable water supply wells. These Regulations supersede all other well construction Regulations heretofore adopted.

1.2.2 No person shall conduct any activity contrary to the provisions of these Regulations. All such activities ~~which~~ that are contracted for shall be carried out only by ~~those~~ a person or persons ~~having~~ possessing a valid license issued by the Department pursuant to the provisions of *7 Del.C.* Section 6023 and the "Regulations for Licensing Water Well Contractors, Pump Installer Contractors, Well Drillers, Well Drivers and Pump Installers."~~"~~

1.2.3 These Regulations apply to the entire life of the well, including but not limited to, construction activities from the initial penetration or excavation of the ground surface through development, equipment installation, disinfection and ~~abandonment~~ sealing of the well. Set up of construction equipment before actual penetration or excavation is not considered part of construction activities.

1.2.4 Before any well construction activities commence to install ~~The installation of~~ any well, as defined in Section ~~2.61~~ 2.0 ~~of these Regulations, including any well installed for the purpose of obtaining geologic or hydrologic information~~ the property owner or property owner's authorized agent must obtain ~~shall receive~~ the prior approval of the Department to construct the well in the form of a well permit.

1.2.5 If any part of these Regulations or the application of any part thereof is held invalid or unconstitutional, the application of such part to other persons or circumstances and the remainder of these Regulations ~~shall~~ are not ~~be~~ affected thereby and shall be deemed valid and effective.

1.2.6 The ~~DNREC~~ Department ~~shall have the right~~ has the authority to require that the well permit and permit conditions be recorded with the Recorder of Deeds office in the county where the well is located.

1.2.7 These Regulations~~, being necessary for the protection and~~

~~conservation of the water resources of the State,~~ shall be liberally construed ~~in order to preserve the land, surface water and ground~~ for the protection and conservation of the water resources of the ~~State of Delaware~~ State to protect public health.

1.2.8 The Department shall have the right to enter at reasonable times upon any private or public property for the purpose of inspecting and investigating conditions relative to the enforcement of these Regulations~~;~~ upon ~~given~~ verbal notice and after presenting official identification to the permitee, owner, occupant, custodian, or agent of the property owner.

1.3 Enforcement and Penalties

The provisions of these Regulations shall be enforced by the Department as provided in ~~7 *Del. C.* Chapter 60~~ Chapter 60 of Title 7 of the Delaware Code. Such enforcement may include but is not limited to revocation of ~~any~~ the violator's well permit for cause. The failure of the Department to enforce any of the provisions of ~~this~~ these ~~Regulation shall~~ Regulations in one case does not constitute a waiver by the Department of any such provisions or right to enforce such provisions in other cases.

2.0 Definitions

The following words or phrases, when used in these Regulations, shall have the meaning ascribed to them in this Section, unless the text clearly indicates otherwise:

"**Abandoned Well**" means a well ~~which has been permanently filled or sealed~~ that is not being used for its intended purpose as determined by the Department.

"Absorption Facility" means a system of open jointed or perforated piping, alternative distribution units or other seepage systems for receiving the flow from septic tanks or other treatment facilities and designed to distribute effluent for oxidation and absorption by the soil within the zone of aeration.

"**Agricultural Well**" means a non-potable well used for ~~the~~ watering ~~of~~ livestock, ~~poultry,~~ aquaculture, ~~uses,~~ or ~~solely for the~~ watering ~~of~~ household yards and gardens, or for other purposes related to farming, ~~in general~~ but not ~~including the irrigation of~~ for irrigating lands or crops. ~~Water is not used for human consumption or to service a dwelling.~~

"**Annular Space (Annulus)"** means the space between ~~two cylindrical objects, one of which surrounds the other, such as the space between a drill hole and a casing pipe or between two well casings~~ a borehole and well casing or between concentric well casings.

"**Applicant**" means the owner~~(s)~~ or owners of the property seeking a well permit,or ~~the~~ his or her legally authorized agent. ~~of the owner(s) as evidenced by sufficient written documentation.~~

"**Aquifer**" means a part of a formation, a formation, or a group of hydraulically connected formations that contains sufficient saturated permeable material to yield economically useful quantities of water to wells and springs.

"Aquifer Interconnection" means a condition that exists when a well is screened or gravel packed across multiple aquifers.

"Aquifer Storage and Recovery (ASR) Well" means a well that is used for artificial recharge of an aquifer to store water for withdrawal usually during peak demand.

"Aquifer Test": means a test conducted by influencing and observing changes in hydraulic head in an aquifer.

"Available" means a public water distribution line or service connection exists within 200 feet of the foundation of the structure or building.

"**Beneficial Use**" means any use of water ~~which~~ that is necessary to the applicant, reasonably non-wasteful, reasonably non-damaging to other water users, and in the best interest of the public as determined by the Department.

~~"Community Water System" means a public water system which serves at least fifteen (15) service connections used by year-round residents or regularly serves at least twenty-five (25) year-round residents.~~

"Call in Authorization Number" means a randomly generated number provided by the Department to the well drilling contractor, that is linked to the well permit number, that conveys the intent to construct the well, and that is required to validate the well permit.

"Certificate of Public Convenience and Necessity (CPCN)" means an authorization issued by the Delaware Public Service Commission for the delivery or provision of a public service to a designated area or parcel of land.

"Confined Aquifer" means a saturated layer of permeable geologic material ~~an aquifer~~ bounded above and below by ~~impermeable beds or by beds of distinctly lower permeability than that of the aquifer itself and containing ground water which is everywhere at a~~ confining layers and where its water pressure is everywhere greater than atmospheric. ~~and from which water in a well will rise to a level above the top of the aquifer.~~

"**Confining Layer**" means a ~~body~~ stratum of impermeable or distinctly less permeable material stratigraphically adjacent to one or more aquifers.

"**Consolidated**" means geologic material that is firm and rigid due to the interlocking or cementation of its mineral components ~~or both~~.

"Construction Well" means a non-potable temporary well used solely to supply water for well construction.

"**Contaminant**" means any substance, either man-made or natural, ~~which is concentrated enough to degrade~~ that degrades or impairs water quality. ~~to a degree which renders such water harmful to public health and safety, or to the environment.~~

"**Contamination**" means the presence of a contaminant in the environment.

"Department" means The Department of Natural Resources and Environmental Control (DNREC).

"Dewatering System" means mechanical equipment used to remove groundwater from an excavation for construction purposes. Equipment consists of a pump, intake and discharge piping, and wells, well points, sumps, or excavations.

"**Dewatering Well**" means a well that is used to remove ~~ground water~~ groundwater for construction or installation of, but not limited to, footings, sewer lines, building foundations, elevator shafts, underground storage tank installations and the like.~~etc.~~

"**Disinfection**" means the inactivation of pathogenic organisms in water by chemical oxidants ~~or equivalent agents~~ ozone, ultraviolet light, or similar treatments.

"**Disposal Area**" means the entire area used for ~~underground dispersion of the liquid portion of sewage~~ the absorption facility.

"**Domestic Well**" means a well ~~primarily~~ that may serve no more than three dwellings and is used for potable non-public water supply purposes and ~~which~~ may be used for non-potable household purposes~~, excluding heat pump supply~~.

"**Drawdown**" means the extent of lowering of the static water level in a well and of the water table or potentiometric surface adjacent to a well, resulting from the discharge of water from a well ~~by pumping or natural flow~~.

"**Drilled Well**" means a well that is ~~excavated wholly or in part by means of a drill such as auger(percussion or rotary) which operates by cutting, abrasion or by use of air pressure or a water jet.~~ constructed using auger, rotary or percussion tools that cut, fracture, or abrade the surface of the earth.

"**Drive Shoe**" means a device fastened to the bottom of a length of casing to aid in driving the well casing.

"**Driven Well**" means a well that is constructed by ~~driving~~ means of pushing or hammering a casing~~, at the end of which there is a drive point~~ and screen~~.~~ including direct push methods, and that does not create an annular space.

"**Dug Well**" means a well that is constructed ~~in an excavation created~~ by the use of picks, shovels, or ~~other hand tools, or by means of a power shovel.~~ an excavator.

"Fire Protection Well" means a non-potable well used for emergency purposes only and not connected to a public water supply distribution system.

"Geophysical Log" means a record of various properties of the formation, borehole, or well obtained by electrical, mechanical, electromagnetic, or other measuring devices.

"**Gravel Pack**" means ~~a~~ processed gravel or coarse sand placed ~~opposite a well screen~~ in the annular space surrounding the well screen to limit the entrance of ~~fine particles and improve well yield.~~ particulates.

"~~Ground Water~~ **Groundwater**" means any water naturally found under the surface of the earth.

"**Grout"** ~~or Grouting Material~~ (noun) means ~~a stable and impervious bonding~~ material~~, reasonably free of shrinkage, which~~ that is capable of providing a ~~watertight~~ seal in the annular ~~spaces~~ space of a well~~.~~ , or for sealing.

"Grout" (verb) means to emplace grout (noun) in an annular space of a well.

"Heat Pump" means a device that transports thermal energy from one environment to another, and in either direction.

"**Heat Pump Closed Loop Well**" means a ~~sealed and pressurized loop of pipe~~ borehole containing a ~~heat exchange solution which is circulated below the earth's surface and utilizes groundwater for the purpose of heat transfer.~~ vertical pressurized circuit of pipe that circulates a water-based solution to exchange heat with groundwater.

"Heat Pump Direct Exchange (DX) Well" means a borehole containing a pressurized circuit of tubing that circulates a refrigerant to exchange heat with groundwater.

"**Heat Pump Recharge Well**" means a non-potable well ~~constructed and primarily~~ that is used ~~for injecting ground water~~ to inject groundwater ~~source~~ heat pump

effluent back into an aquifer~~, and which may be used for other non-potable water supply purposes provided prior written approval is obtained from the Department~~.

"**Heat Pump Supply Well**" means a well ~~constructed primarily to obtain ground water as a source for~~ used to withdraw groundwater for thermal exchange in a heat pump ~~supply purposes and which~~ and that may also be used for ~~other purposes, including domestic water~~ potable supply.~~, provided prior written approval is obtained from the Department.~~

"**Industrial Well**" means a non-potable well ~~which~~ that is used in the processing, washing, packaging, or manufacturing of a product excluding food and beverages.

"**Injection Well**" means a well that is used to ~~inject~~ place fluid into the subsurface as regulated ~~in~~ by the ~~"~~Regulations Governing Underground Injection Control.~~"~~

"**Irrigation Well**" means a non-potable well ~~which~~ that is used for ~~the~~ watering ~~of~~ lands or crops other than household lawns and gardens.

"Jetted Well" means a well that is constructed using a high velocity stream of water.

"Lysimeter" means a device for withdrawing pore water samples from the unsaturated zone and that does not intersect the water table.

"Miscellaneous ~~Public~~ Well" means a non-potable well ~~which supplies water for potable and other beneficial uses to service stations, stores, small offices, businesses, etc. with less than twenty five (25) employees; and from which the water is not used in the manufacture or preparation of food or beverages for sale to or use by the public in general.~~ used for beneficial purposes but that is not included in any other well categories defined by these Regulations, and that is not connected to a public water system or private home.

"**Monitor Well**" means a non-potable well ~~installed for the sole purpose of the determination of subsurface conditions and~~ that is used primarily for collecting ~~ground water~~ groundwater samples.

"Multiple ~~Screening~~ Screens" means the ~~placing (in a single well)~~ use of more than one screen ~~in different or separated water-bearing units~~, or of a continuous screen, in well construction, connecting ~~two or more water bearing units.~~ multiple water-bearing zones within a single aquifer.

"**Observation Well**" means a non-pumping, non-potable well used for ~~the sole purpose of determining ground water~~ measuring groundwater levels or the potentiometric surface.

"Operator" means the person responsible for the operation of a well or water system.

"**Person**" means any individual, firm, association, organization, partnership, business trust, corporation, company, contractor, supplier, installer, user, or owner, or any Federal, State or local governmental agency or public district or any officer or employee ~~thereof~~ of these.

"Piedmont Physiographic Province" means the land area consisting of rolling hills composed of crystalline rocks located north of a line drawn between Newark and Wilmington.

"**Piezometer**" means ~~a small diameter non-pumping well with a short screen that is used to measure elevation of the water table or potentiometric surface.~~ an alternate word for observation well.

"**Pitless Well Adapter**" means a device designed for attachment to one or more openings through a well casing, provided with a pitless well cap, and so constructed as to prevent the entry of contamination into the well. ~~The adapter is used to conduct water to or from the well, protect the water from freezing temperatures and provide access to the well and water system components within the well.~~

"**Pitless Well Cap**" means a ~~sanitary~~ device that ~~covers and~~ encloses the upper termination of the well casing above a pitless well adapter or unit and provides for connections for electrical power lines and a screened well vent.

"**Pitless Well Unit**" means a pre-assembled device ~~which~~ that extends the upper end of a well casing to above grade, provided with a pitless well cap, and so constructed as to prevent the entry of contamination into the well. ~~or potable water. The unit is used to conduct water to or from the well, protect the water from freezing temperatures and provide access to the well and to the water system components within the well~~

"**Potable Water**" means any water ~~which~~ that is in compliance with all the ~~primary health related~~ required drinking water standards specified in the Delaware Regulations Governing Public Drinking Water Systems and the US EPA Safe Drinking Water Act, and that is acceptable for human consumption.

"**Potential Source of Contamination**" ~~Anything~~ means anything that may introduce a ~~contaminants~~ contaminant ~~so as to~~ that could cause ~~a violation of~~ water to fail to meet applicable water standards. ~~or otherwise interfere with water uses.~~ Examples may include, but are not limited to, underground storage tanks for petroleum products, absorption facilities, wastewater disposal areas, landfills, ~~and~~ confined animal feed lot operations, and storm water management facilities.

"**Pressure Grouting**" means the emplacement of grout materials under positive pressure by means of a conductor (tremie) pipe.

"Public Water System (PWS)" means a water supply system for the provision to the public of water for human consumption through pipes or other constructed conveyances either directly from the user's free flowing outlet or indirectly by the water being used to manufacture ice, foods and beverages or that supplies water for potable or domestic purposes for consumption in more than three dwelling units, or furnishes water for potable or domestic purposes to employees, tenants, members, guests or the public at large in commercial offices, industrial areas, multiple dwellings or semi-public buildings including, but without limitation, rooming and boarding houses, motels, tourist cabins, mobile home parks, restaurants, hospitals and other institutions, or offers any water for sale for potable domestic purposes. Public water systems are classified as follows:

- **"Community Water System (CWS)"** means a public water system that serves at least 15 service connections used by year round residents or regularly serves at least 25 year-round residents.

- **"Non-Transient Non-Community Water System (NTNCWS)"** means a public water system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year.

- **"Transient Non-Community Water System (TNCWS)"** means a public water system that has at least 15 service connections or regularly serves an average

of at least 25 individuals daily at least 60 days out of the year.

- **"Miscellaneous Public Water System (MPWS)"** means a public water system that is neither community, transient non-community, nor non-transient non-community.

"**Public Well**" means a well ~~which~~ that is used to supply water to more than three dwelling units, ~~twenty-five (25)~~ 25 or more employees~~; in the manufacture of ice, foods, or beverages; to the public in food washing, processing, or preparation in a plant, restaurant, or other facility.~~ or for the preparation or manufacturing of food or beverages, or to the public at large.

"**Pump Installer**" means any person ~~licensed by~~ holding an appropriate license issued by the State of Delaware to act in responsible charge of all on-site work in the installation, modification, and repair of water pumps and related equipment.

"**Pump Installer Contractor**" means any person licensed by the State of Delaware to engage in the business of contracting for the installation, modification, and repair of water well pumps and related equipment.

"**Pump Pit**" means ~~a hole or depression in the ground in which the well and external pumping equipment is contained, and which is not protected from freezing.~~ an underground enclosure that contains pumping equipment external to the well, and may also contain the well and other water system components.

"**Recovery Well**" means a well that is used to withdraw contaminants or contaminated ~~ground water~~ groundwater.

"Regulations" mean Delaware Regulations Governing the Construction and Use of Wells.

"Sealing" means removal of pumping equipment, if applicable, and emplacing grout the entire length of a well so as to make it permanently decommissioned.

"**Secretary**" means the Secretary of the Department of Natural Resources and Environmental Control or ~~his~~ the Secretary's duly authorized designee.

"**Septic Tank**" means a water tight receptacle ~~which~~ that receives the discharge of ~~sanitary sewage~~ wastewater from a structure or part of a structure and is designed and constructed so as to permit settling of ~~settleable~~ solids from the liquid, digestion of the organic matter by detention, and discharge of the liquid portion into ~~a disposal area~~ an absorption facility.

"**Service Connection**" means a water line from a ~~public~~ water supply system to a dwelling or building.

"SIRS" means the Department's Site Investigation and Restoration Section.

"**Soil Boring**" means ~~an uncased excavation done~~ a borehole for the purpose of determining the physical or chemical characteristics of soil or sediment.

"**Source of Contamination**" means anything that ~~introduces contaminants so as to cause~~ is known to have introduced a contaminant that has caused a violation of applicable water quality standards. ~~or otherwise interfere with water uses.~~ Examples may include, but are not limited to, underground storage tanks for petroleum products, wastewater disposal areas, landfills, ~~and~~ confined animal feed lot operations and storm water management facilities.

"**Static Water Level**" means the elevation of water in a well not under the influence of pumping.

"**Suction Line**" means a pipe ~~which~~ that conveys water from a well ~~to~~ by a pump ~~under vacuum conditions~~ creating negative pressure.

~~"Temporary Well" means a well used to supply water for well construction.~~

"**Test Well**" means a temporary well installed to ~~ascertain~~ determine the lithology and water transmission properties of an aquifer or geologic materials and ~~which~~ that may be used to determine water quality~~; a well which is not used on a permanent basis~~.

"**Unconfined Aquifer**" means an aquifer ~~in which~~ where no relatively impermeable layer exists between the water table and the ground surface and ~~an aquifer in which~~ the water surface is at atmospheric pressure.

"**Unconsolidated**" means ~~geologic material that is loosely arranged and whose particles are~~ not cemented ~~together~~ as in soil, sediment, or other geologic material.

"Unrecorded Well" means an existing well for which the Department has no record.

"**Water Well Contractor**" means any person licensed by the State of Delaware to engage in the business of contracting for the construction and repair of wells, and contracting for ~~or~~ the installation or repair of ~~pumping equipment in or for wells, or both.~~ well pumps and related equipment.

"**Well**" means any excavation that ~~is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed when the intended use of such excavation is for the location, testing, acquisition, use, for extracting water from, or for the artificial recharge of subsurface fluids, and where the depth is greater than the diameter or width. For the purpose of this regulation this definition does not include geotechnical test; soil, telephone, and construction piling borings; fence posts, test pits, or horizontal closed loop heat pump circulation systems constructed within twenty (20) feet of the ground surface.~~ intersects the water table, and is installed for the purpose of obtaining geologic or hydrologic information and for locating, testing, measuring, extracting, or recharging water and other fluids, and where the depth is greater than the width. Such excavations may have been drilled, augured, cored, bored, driven, dug, jetted, or otherwise constructed. This definition does not include excavations for dewatering trenches, utility poles, construction pilings, building foundations, fence posts, test pits, or horizontal heat pump systems.

"**Well Casing**" means ~~the pipe installed in a well to give unobstructed access to a water bearing unit, to provide protection during and after installation, or both.~~ closed-wall pipe used to provide access from the ground surface to a water-bearing unit.

"**Well Development**" means the process of removing fine material from the well to improve yield and water quality.

"**Well Driller"** means any person licensed by the State of Delaware to act in responsible charge of all on-site work relating to the drilling, construction, development, and testing of wells; well alteration and repair, test boring and coring; and the installation, modification, and repair of well pumps and related equipment.

"Well Driver" means any person licensed by the State of Delaware to act in responsible charge for all on-site work relating to the driving, construction, development, and testing of driven wells; alteration and repair of driven wells; and the installation, modification and repair of water well pumps and related equipment ordinarily used in driven wells.

"**Well Pit**" means ~~a hole or depression in the ground surface around a well casing in which the~~ an underground enclosure that contains a well head that is capped below

grade. ~~and which does not contain pumping equipment.~~

"**Well Point**" means a shallow well that is typically used series with a manifold and pumped together by suction to dewater an excavation.

"**Well Screen**" means a ~~structural device which supports the well excavation, allows entrance of sub-surface fluids into a well or exit from a recharge well, and which acts as a filter to keep sediment from entering a well.~~ filtering device (e.g. manufactured perforated pipe) used as a sediment filter allowing entrance or exit of sub-surface fluids.

"**Wick Drain**" means a prefabricated ~~drainage strip which is driven into the ground for the removal of pore water from the soil, therefore consolidating compressible soils. The wick drain design allows for escaping water to follow gravitational forces and to drain downwards or upwards into granular drainage layers or to the ground surface.~~ strip that is inserted into the ground for draining water and consolidating compressible soils or sediments.

3.0 General Permitting Requirements and Procedures

3.1 Permit Required

3.1.1 A well may not be constructed until the Department has issued a well permit ~~to the applicant,~~ and a call-in authorization number unless otherwise authorized under ~~Section 3.11 of these regulations~~ Subsection 3.13. A well permit is not required for the construction of ~~piezometers with a hand auger or hand operated driver or for the construction of wick drains in the unconfined aquifer.~~ hand augured soil borings or other soil borings that do not intersect the water table (such as direct push soil borings).

3.1.2 A lysimeter may not be constructed until the Department has issued a well permit number. Lysimeters shall be constructed or repaired by qualified professionals as approved by the responsible program and are not required to be installed by a licensed well driller or driver.

~~3.1.2~~3.1.3 A well permit is required for the construction and use of all wells and lysimeters.

3.2 Well Repair

A well permit is not required ~~if an existing well requires only repair or rehabilitation (the restoration of a well's original yield, to the best extent possible) and the location and physical dimensions of the well are not changed. A change in physical dimensions, such as deepening, making more shallow, enlarging, or reducing the length or diameter of either the screen or well casing shall require an application for a well permit as set forth in the remainder of this Section. The Department may consider the approval of additional repair procedures on a case-by-case basis.~~ for the repair or rehabilitation of a well or associated equipment, provided the physical dimensions of the well are not changed, pursuant to Subsection 9.3. A change in physical dimensions or exceedance of original capacity shall require an application for a well permit as set forth in the remainder of this Section.

3.3 License Required

The construction, repair, modification, or ~~abandonment of wells and the installation of pumps and pumping equipment in and for water wells shall be performed by or under the direct on-site supervision of an individual licensed pursuant to the requirements of 7 **Del.C.** §6023 and the requirements of the "Regulations for Licensing Water Well Contractors, Pump Installer Contractors, Well Drillers, Well Drivers, and Pump Installers."~~ sealing of wells shall be performed by or under the direct on-site supervision of a licensed well driller or well driver. The installation of well pumps and pumping equipment shall be performed by or under the direct on-site supervision of a licensed pump installer, plumber or well driller. Except as permitted by 7 *Del.C*. Chapter 6023, the above referenced persons shall be licensed under the requirements of the Delaware Regulations for Licensing Water Well Contractors, Pump Installer Contractors, Well Drillers, Well Drivers, and Pump Installers.

3.4 Permit Preparers

All well permit applications shall be prepared and submitted by a ~~water well contractor.~~ Delaware licensed well driller or driver pursuant to Subsection 3.1.2.

3.5 General Permit Application Procedures

3.5.1 All applications ~~for well permits~~ shall be made on ~~forms provided by the Department.~~ Department provided paper or electronic forms.

3.5.2 All applications shall be legible and complete~~. An illegible or incomplete application shall be returned to the preparer with a statement of the reason for rejection.~~ , including such plans, specifications, and other relevant information for review by the

Department. All applications must include evidence of property ownership in the form of a zoning verification, settlement agreement, tax assessor's record, or an easement or access agreement showing the applicant's authority to construct a well, or the authorized agent for government owned lands. In the event an outstanding issue is identified during the Department's review that renders the application incomplete, the Department will return the application to the preparer along with a letter describing what information or material is missing.

3.5.3 All applications shall be signed by the ~~proper~~ applicant or their ~~duly designated~~ legally authorized agent or be attested to by the permit preparer for electronic applications. The applicant may be penalized for submitting false information.

3.5.4 All ~~well~~ applications shall be signed by the permit preparer. ~~as stated in Section 3.4 of these Regulations.~~ The permit preparer may be penalized for submitting false information.

3.5.5 All applications shall be accompanied by an application fee and an advertisement fee, if applicable.

3.5.6 Wells shall only be used for ~~their designated use as defined in Section 2 of these Regulations.~~ the purposes designated by the permit.

3.5.7 The Department ~~shall~~ will not consider the issuance of a ~~new well~~ permit for a potable water supply well on ~~a previously~~ an undeveloped ~~property~~ parcel until ~~after~~ the on-site wastewater treatment and disposal system ~~construction~~ permit for the ~~property~~ parcel has been issued, or ~~it is demonstrated that~~ central sewer service is available to the ~~property.~~ parcel, except in the case of a water utility or municipality when it is shown that no sewer service or on-site wastewater treatment and disposal is necessary for the parcel.

3.5.8 ~~All well permit applications shall contain the tax map, block, and parcel number for the property on which the well is to be constructed.~~ For wells which will be constructed in areas where no tax map numbers are assigned, ~~some evidence to that fact must be submitted with the well permit application in lieu of the tax map, block and parcel number.~~ a utility or safety permit shall be submitted with the application.

3.6 Dewatering ~~Well~~ System Application Procedures

3.6.1 Applications for dewatering systems shall be submitted on forms supplied by the Department.

~~3.6.1~~3.6.2 Permit applications for dewatering wells shall include:

3.6.2.1 Proof of authorization from the property owner (e.g. access or easement agreement) for the contractor to construct, and for the operator to operate the proposed dewatering system, and

~~3.6.1.1~~ 3.6.2.2 Duration of project; and

~~3.6.1.2~~ 3.6.2.3 ~~Location~~ Total depth and number of wells or excavations and location of water discharge, and

~~3.6.1.3~~ 3.6.2.4 Project location map and ~~including~~ site map ~~and well point layout noting the estimated number of dewatering wells/points for the project.~~ showing well, well point, or excavation layout noting the estimated number of wells, well points, or sumps for the project; and

~~3.6.1.4~~ 3.6.2.5 Maximum daily ~~Quantity~~ quantity of water to be pumped in gallons and peak rate in gallons per minute.

~~3.6.2~~3.6.3 Permits are valid for the duration of the project as described in the application. ~~The construction authorized by the permit shall commence prior to the expiration date of the permit.~~ The operation of the dewatering system authorized by the permit shall cease on or prior to the expiration date of the permit.

~~3.6.3~~3.6.4 The Department may require additional information concerning the operation of the dewatering system prior to issuance of ~~any dewatering~~ the permit.

~~3.6.4~~3.6.5 Withdrawals from dewatering ~~facilities~~ systems are subject to the requirements of ~~Section~~ Subsection ~~3.10.11~~ 3.12.12.

~~3.6.5~~3.6.6 Water quality tests may be required as part of the application, at the discretion of the Department, where the Department has reason to believe that ~~ground water~~ groundwater contamination may exist ~~in~~ at or near the proposed construction site.

3.6.7 The owner of the dewatering system may be required to analyze the extent of potential impact to other permitted water users and submit the findings to the Department.

3.6.8 The owner of the dewatering system may be required to provide reasonable assurance that the operation will not cause erosion at the point of discharge or introduce unacceptable turbidity into the receiving water body.

3.6.9 Applications for multiple well points may be submitted on a single form provided that all well points are located on a single tax parcel and are identical in construction. For deep dewatering wells using submersible pumps, and sumps, separate applications are required for each.

3.7 Injection Well Application Procedures

3.7.1 A separate application is required for each well and each application shall show the total number, diameter, and spacing of injection wells for the entire system. The Department may require additional plans or drawings showing the overall operation of the injection system.

3.7.2 The Department will not issue well construction permits for wells that require a separate permit from the Underground Injection Control (UIC) program until the UIC permit is issued unless otherwise approved by the Department.

~~3.7~~3.8 Closed Loop Heat Pump Application Procedures

~~3.7.1~~3.8.1 ~~Permit Applications shall show the total number of vertical loops for one system on one application form.~~ The application shall show the total number, diameter, and spacing of vertical loops for one system on one form. The Department may require an additional site plan showing all closed loop locations for commercial-scale projects.

~~3.7.2 One application fee shall be assessed for each application form submitted.~~

~~3.8~~3.9 Monitor and Observation ~~Well~~ (Piezometer) Wells and Soil Boring Application Procedures

~~3.8.1~~ 3.9.1 Applications for monitor and observation wells (piezometers) and soil borings that intersect the water table shall be submitted on ~~special~~ forms provided by the Department.

~~3.8.2~~ 3.9.2 Applications for a maximum of ~~ten (10)~~ 10 monitor wells, ~~or~~ observation wells (piezometers), or soil borings that intersect the water table may be submitted on a single paper form, or an unlimited number of monitor wells, observation wells (piezometers), or soil borings that intersect the water table may be submitted electronically provided the following applies:

~~3.8.2.1~~ 3.9.2.1 ~~all~~ All wells or soil borings are proposed with ~~similar~~ identical construction; and

~~3.8.2.2~~ 3.9.2.2 All wells or soil borings are located on the same tax map parcel number and associated with one project; and

~~3.8.2.3~~ 3.9.2.3 All wells or soil borings are screened in the same aquifer.

~~3.8.3 Monitor and Observation well applications shall be accompanied by the appropriate fee if applicable. Monitor well applications require one fee per project for any number of wells submitted for review at one time.~~

~~3.8.4 Completion reports for monitor wells shall adhere to the requirements of Section 7 of these Regulations.~~

~~3.9~~3.10 Application Procedures ~~for Permits~~ to Continue to Use Existing Wells

3.10.1 A permit to continue use is required when the Department has determined that an unrecorded well exists.

~~3.9.1~~ 3.10.2 Applications for permits to use ~~existing~~ unrecorded wells shall, to the extent practicable, contain the same information ~~similar to that~~ as required in ~~an application for a well permit.~~ an application for a permit to construct a new well.

~~3.9.2~~ 3.10.3 ~~Existing wells for which a use permit application is submitted must meet the criteria contained in these Regulations.~~ Unrecorded wells shall meet the requirements contained in these Regulations for the applicable well classification prior to being permitted.

~~3.9.3 The Department may impose special use conditions which may include but are not limited to the conditions contained in the original well permit.~~

3.11 Application Procedures to Reclassify Wells

3.11.1 Upon receipt of a complete application and the appropriate fee, the Department may consider approving a request to change an existing well from one classification to another.

3.11.2 Wells proposed for reclassification must meet the requirements contained in these Regulations for the proposed well classification.

3.11.3 Test wells may only be reclassified to observation, monitoring, or irrigation wells upon approval by the Department.

3.11.4 The Department may specify additional conditions with the reclassification that may include, but are not limited to, the conditions contained in the original well permit.

~~3.10~~3.12 Permit Issuance Procedures

~~3.10.1~~13.12.1 Advertising Requirements

~~3.10.1.1~~13.12.1.1 Any permit application or combination of applications ~~received for a well(s)~~ located on ~~a tract of land owned by the same person,~~ the same tax parcel, where the total estimated withdrawal is greater than ~~fifty thousand (50,000)~~ 1 million gallons per day, shall be advertised in newspapers of local and statewide circulation with a comment period of ~~fifteen (15)~~ 15 days before issuance of the well permit(s). Fire protection wells are exempt from this requirement.

~~3.10.1.2 A second advertisement will not be required if all of the following conditions are met:~~

~~3.10.1.2.1 the well was never installed,~~

~~3.10.1.2.2 the requested usage rate and well construction details have not changed.~~

3.12.1.2 If the well permit has expired, or the requested water usage rate has increased, or well construction details or source aquifer has changed, then a new well permit application will be required. If the water usage rate has increased to over 1 million gallons per day, re-advertisement will be required.

3.12.1.3 The Department at its sole discretion and upon receipt of sufficient justification may issue the permit prior to the expiration of the above comment period on a case-by-case basis. In such cases the owner will be proceeding at their own risk with the permit still subject to public hearing requirements.

~~3.10.2~~3.12.2 The Department~~, in considering applications and granting permits,~~ shall take into account the ~~geology, hydrology and hydraulics of the area of interest, population density and water use, character of surface and subsurface, water quality, depletion rate of the water resources, sources of contamination, and other factors as may be relevant to the protection of the water resources and water supply.~~ hydrogeology, effect on water levels, sources of contamination, water quality, population density, water use, and other factors as may be relevant in the area of the proposed well to protect the water resources of the State and for the protection of human health.

~~3.10.3~~3.12.3 The Department, in its discretion, may ~~place special conditions on the well permit such as, but not limited to, a requirement for double casing, special grouting requirements, special use restrictions, depth restrictions, notification of installation date, and special material requirements to protect the water resources, water supply, and the public health, safety and welfare.~~ specify additional permit conditions including, but not limited to double casing, specialized grouting, water use or depth restrictions, advance notification prior to construction, special material requirements, geophysical logging, water quality sampling, and formation sampling.

~~3.10.4 Where an approved public water supply system is legally and reasonably available to the site to be served, the Department shall deny an application for a well permit for a potable water well. A public water supply system is deemed legally available when a Certificate of Public Convenience and Necessity has been granted to a water utility for the site. A public water supply system is deemed reasonably available when a public water distribution line is located within two hundred (200) feet of the structure or building to be served. However, a public water supply system shall not be considered reasonably available by the Department if topographic or manmade features make connection physically impractical. The Department shall not deny a well permit for a non-potable well solely on the basis of the availability of a public water supply system.~~

3.12.4 The Department may not withhold an application for a permit for a potable well within the service territory served by a water utility under a CPCN or require an applicant to utilize the services of the utility in the CPCN area unless:

3.12.4.1 The Delaware Geological Survey or the Division of Public Health certifies that groundwater supply is inadequate or unsuitable for the intended permitted use; or

3.12.4.2 The water utility demonstrates that it can provide service of equal or better quality at lower cost; or

3.12.4.3 The permit applicant is a resident of a municipality, county water district authority, or a recorded development where public water is available. A public water supply is deemed reasonably available when a public water distribution line is located within 200 feet of the foundation of the structure or building being served.

3.12.5 Subsections 3.12.4.2 and 3.12.4.3 do not apply for permits for potable wells for a farm, farmlands, or the lands of an existing mobile home community.

3.12.6 The Department shall not withhold an application for a permit for a non-potable well in an area serviced by a water utility under a CPCN.

~~3.10.5~~3.12.7 When ~~proposed wells, with the exception of monitor, observation, and recovery wells, are~~ a proposed potable, agricultural, heat pump, or miscellaneous well is to be located within the jurisdiction or service area of a municipality serving public water, the applicant shall ~~submit~~ include a written statement of approval from said municipality with the well permit application.

~~3.10.6 The Department may require, as a permit condition, that certain tests be done such as, but not limited to, the performance of a geophysical log on the well, the determination of water quality parameters, and the taking of formation samples.~~

3.12.8 When a proposed potable, agricultural, heat pump, or miscellaneous well is to be located within the CPCN of a private public water provider, the Department shall notify the public water provider in writing.

~~3.10.7 The Department may require aquifer tests as a condition of any well permit. These tests may require the construction and use of one or more observation or monitor wells.~~

~~3.10.8 A well permit number may be given verbally over the telephone in emergency circumstances in accordance with Section 3.11 of these Regulations, or when the application has been approved and is or should be in transit to the applicant.~~

3.12.9 The Department may require aquifer tests as a condition of certain well permits. These tests may require the construction and use of one or more observation or monitor wells. Aquifer tests shall be conducted in accordance with published aquifer test procedures.

~~3.10.9~~3.12.10 An application ~~which~~ that is denied pursuant to these Regulations will ~~shall~~ be returned to the ~~applicant accompanied by an explanation of the reasons for rejection.~~ preparer along with a letter of explanation, and a copy to the applicant.

~~3.10.10 All water wells constructed for production purposes shall be put to beneficial use.~~

3.12.11 All wells shall be used for their intended purpose and withdrawn water shall be put to beneficial use. If a well is not used for its intended purpose, the Department may order it to be properly sealed.

~~3.10.11~~3.12.12 All wells and dewatering facilities are subject to ~~7 *Del.C.* §6031 and §6037~~ Sections 6031 and 6037 of Chapter 60 of Title 7 of the Delaware Code ~~which set forth~~ that mandates responsibilities ~~as it concerns remedying the~~ concerning water supply depletion~~, exhaustion,~~ or water quality degradation of any existing use of water caused as a result of any operation authorized under the ~~approved~~ permit.

~~3.11~~3.13 Emergency ~~Circumstances~~ Well Permitting

~~3.11.1~~3.13.1 An emergency circumstance is deemed to exist ~~where~~ when a well ~~will replace an existing~~ is replacing a failed well and ~~where~~ when the Department determines that the lack of water ~~or delay in obtaining water~~ poses an immediate ~~and significant~~ danger to the health or welfare of persons ~~or their property~~ or ~~where~~ when

the Department, in its discretion, has determined that other exceptional circumstances exist.

~~3.11.2~~3.13.2 A permit number may be ~~given~~ issued verbally during business hours for the installation of a well installed due to an emergency pursuant to Subsection 3.13.1. ~~where an emergency circumstance exists.~~ If the well permit number is issued prior to well installation of the well, the driller must obtain an authorization number from the Department to validate the well permit. Within 72 hours after issuance, the driller shall submit an application, applicable fee, and completion report.

~~3.11.3 Within seventy-two (72) hours after the verbal issuance of a permit number under emergency circumstances, the applicant shall submit to the Department a well permit application and well completion report, which shall include the permit number.~~

~~3.11.4~~3.13.3 ~~In instances where~~ For an emergency ~~circumstance exists at times~~ when State offices are closed, a well may be constructed ~~providing~~ provided that ~~it replaces an existing well and that~~ the Department is notified ~~verbally~~ on the first ~~working~~ business day following such action. ~~A well permit application (including the well permit number), the appropriate application fee, and a well completion report shall be submitted within seventy-two (72) hours after notification.~~ The driller shall submit an application, application fee, completion report, and sealing report for the replaced well, by close of business that day except for emergency replacement wells for irrigation wells that must be submitted within 72 hours after the Department has been notified.

~~3.11.5~~3.13.4 All wells constructed under emergency circumstances shall be constructed in conformance with these Regulations. ~~and all officially established policies.~~

3.13.5 Any well that is constructed under emergency circumstances will not have been reviewed by the Department pursuant to Subsection 3.12.2. The driller must inform the owner that construction is at the owner's risk. The Department's review may result in the well being ordered sealed and relocated.

~~3.12~~3.14 Well Relocation During Construction

3.14.1 ~~If it is necessary to relocatea proposed well or a~~ An incomplete or newly constructed well ~~in order to obtain sufficient yield, potable water, overcome a well construction problem, avoid power lines or underground utilities, to meet a distance requirement; or, in the case of monitor wells, to react~~ adjust to ~~newly discovered~~ field conditions ~~determined during geophysical surveys, test pits or prior drilling, the well driller may relocate the well construction site~~ may be relocated to adjust to newly discovered field conditions or to overcome a construction problem, under the authority of the original permit provided that:

~~3.12.1~~3.14.1.1 ~~Any~~ The new ~~site~~ location meets the siting requirements of these Regulations;

~~3.12.2~~3.14.1.2 The new ~~well~~ location is ~~situated~~ on the same tax parcel ~~number~~ listed on the permit; and

3.14.1.3 The permit does not contain a condition that prohibits relocation.

~~3.12.3~~3.14.2 The unsuccessful well, cased or uncased, shall be ~~abandoned in accordance with the requirements of~~ sealed pursuant to Section ~~9~~ 10.0. ~~of these Regulations before the drilling equipment is removed from the site.~~ The unsuccessful well shall be sealed concurrent with, or prior to, the construction of the relocated well.

3.14.3 Call in authorization must be cancelled if the drill rig is removed from the site prior to construction of the relocated well. A new call in authorization number must be obtained prior to resuming construction.

3.14.4 The relocated well location must be clearly shown on the completion report.

~~3.12.4~~3.14.5 Monitor, observation, or recovery wells or soil borings shall ~~not~~ only be relocated ~~beyond the limits~~ within the boundary of the site ~~as described on the well permit application(s).~~ plan accompanying the permit application(s).

~~3.13 Water Well Contractor and Well Driller Responsibilities~~

~~3.13.1 The water well contractor and well driller or well driver are responsible for construction of the well in accordance with the conditions of the permit and applicable laws and Regulations.~~

~~3.13.2 The well driller or well driver is required to have at the drilling site a copy of the signed well permit or, in the case of verbal permits, the permit number.~~

~~3.13.3 A well driller or well driver shall physically be present to conduct or supervise the actual on-site work of constructing a water well.~~

~~3.13.4 Upon completion of the well, the water well contractor shall submit to the Department a legible well completion report as set forth in Section 7 of these Regulations.~~

~~3.14 Property Owner's Responsibilities~~

~~3.14.1 The property owner is responsible for maintaining the well in accordance with these Regulations and in compliance with all applicable well permit conditions including but not limited to maintenance of the upper terminus and well tag.~~

~~3.14.2 The property owner is responsible for having any damage to the well repaired by a well driller.~~

~~3.14.3 It is the responsibility of the property owner to have a failed well properly abandoned and sealed by a well driller within sixty (60) days of construction of a replacement well. If the well is not abandoned and sealed at the end of this period the Department may have the well abandoned and sealed at the well owner's expense, unless specific written approval for maintaining the replaced well is granted by the Department.~~

~~3.15 Pump Installer Contractor Responsibilities~~

~~When it is necessary for a pump installer contractor or their licensed employee to open a well for any reason, the pump installer contractor is responsible for maintaining the well, while the well is open, in accordance with these Regulations and in compliance with all applicable well permit conditions including but not limited to maintenance of the upper terminus, well tag, well cap, and disinfection of the well.~~

~~3.16 Temporary Wells for Construction Water~~

~~3.16.1 Upon application, the Department may issue a permit for a temporary well to supply drilling water for a new well installation. In acting on the application for a temporary well, consideration will be given to area geology and ground water quality. To the extent practicable, the application for a temporary well should be submitted in conjunction with the application for the new well or wells.~~

~~3.16.2 All temporary wells shall be abandoned and sealed in accordance with Section 9 of the Regulations, or converted to another use in accordance with Section 3.21 of these Regulations, within thirty (30) days of completion of the new well(s), unless an extension is granted in writing by the Department.~~

3.15 Well Relocation Prior to Permit Issuance

If it is necessary to relocate a well as a result of the Department's hydrological review, the

applicant may:

3.15.1 Submit a new application showing the revised location; or

3.15.2 Resubmit the original application showing the revised location, initialed by the well driller.

~~3.17 Permit Transfer~~

~~A well permit is transferable. by the property owner, by providing a copy of the well permit in its entirety, including the well permit conditions, to the subsequent property owner.~~

~~3.18~~3.16 Cancellation of Permits

The Department shall have the right to ~~cancel~~ void any permit for a well that has not yet been constructed ~~or is not in the process of being constructed.~~ for the protection and conservation of the water resources of the State or to protect public health as determined in the Department's discretion.

~~3.19~~3.17 Permit Duration

A permit shall be valid for a period of one ~~(1)~~ year from the date of issuance by the Department during which time the well may be constructed provided the call in authorization number has been obtained, except as required in ~~Section 3.06.2~~ Subsection 3.6.3. ~~of these Regulations.~~

3.18 Permit Extension

A permit extension request may be approved by the Department not to exceed two years from the original date of issuance.

~~3.20~~3.19 Approval for Use

~~3.20.1~~3.19.1 Well permits are issued for construction and use, except as noted in ~~Section~~ Subsections ~~3.20.2~~ 3.19.2 and ~~3.20.3~~ 3.19.3. ~~of these Regulations~~.

~~3.20.2~~3.19.2 Any well, ~~permit~~ or combination of ~~permits issued for well(s), with the exception of non- potable wells constructed and used for fire protection purposes only,~~ wells located on ~~a tract of land owned by the same person~~ the same parcel, where the total estimated yield or use is greater than ~~fifty- thousand (50,000)~~ 50,000 gallons per day are not authorized for ~~construction and testing only~~ use. Prior to putting the well~~(s)~~ into service the ~~owner~~ applicant, ~~shall apply for and receive a Water Allocation Permit as set forth~~ as defined in the ~~"~~Regulations Governing the Allocation of Water.~~",~~ shall apply for a Water Allocation Permit. Fire protection wells are exempt from this requirement.

~~3.20.3~~3.19.3 ~~Approval for use shall be obtained from the Division of Public Health for all miscellaneous public, industrial, and public wells prior to their use.~~ Prior to the use of a public well, the water supplier shall obtain approval from the Division of Public Health.

3.19.4 The Department may consider approving a request to change an existing well from one classification to another pursuant to Subsection 3.11.

~~3.21 Changing Well Classification~~

~~Upon receipt of a complete application and the appropriate fee, the Department may consider approving a request to change an existing well from one classification to another, such as in the changing of a test well to a public water well.~~

3.20 Permit Transfer

A well permit is not transferable unless approved by the Department with written request by the owner.

~~3.22~~3.21 Water Service Piping

Water service piping from the well to the structure~~(s)~~ shall be installed in accordance with the requirements of the "~~State of~~ Delaware Regulations Governing a Detailed Plumbing Code", administered by the ~~Department of Health and Social Services,~~ Division of Public Health.

4.0 Responsibilities of Parties

4.1 Water Well Contractor and Well Driller Responsibilities

4.1.1 The water well contractor and well driller shall ensure construction of the well in accordance with the conditions of the permit and applicable laws and Regulations.

4.1.2 The well driller is required to have a paper or electronic copy of the well permit, permit number, and authorization number on site. In the case of emergency replacement wells approved verbally during office hours, the well driller is required to have the permit number and authorization number on site. In the case of an emergency replacement well that is constructed when State offices are closed, a permit number and an authorization number are not required. The driller and applicant must comply with Subsection 3.13.3.

4.1.3 The well driller shall attach the well identification tag supplied by the Department prior to demobilizing, with the exception of an emergency well pursuant to Subsection 11.2.

4.1.4 Upon completion of the well, the water well contractor shall submit to the Department a legible well completion report and formation log pursuant to Section 8.0.

4.1.5 If a driller, other than the preparer of the application, constructs the well, that driller must obtain an authorization number prior to construction of the well.

4.2 Property Owner's Responsibilities

4.2.1 The property owner shall maintain the well in accordance with these Regulations and in compliance with all applicable permit conditions including, but not limited to, maintenance of the upper terminus and identification tag.

4.2.2 The property owner is responsible for having any damage to the well repaired by a license well driller.

4.2.3 The property owner shall have a failed or abandoned well properly sealed by a license well driller pursuant to Section 10.0. The well must be sealed within 15 days of construction of a replacement well. If the well is not sealed at the end of this period the Department may have the well sealed at the well owner's expense. A replaced well may be retained if the Department approves the continued use or reclassification of the well pursuant to Subsections 3.10 and 3.11.

4.3 Pump Installer Contractor Responsibilities

The pump installer contractor, or their licensed employee, shall install, repair, or replace pumps to maintain the well in accordance with the conditions of the permit and applicable laws and Regulations.

4.05.0 Well Construction Standards

4.15.1 Siting Criteria

4.1.1 All wells, except for monitor, recovery, dewatering, and observation wells shall satisfy the following minimum horizontal separation distance requirements:

4.1.1.1 Ten (10) feet from a property line (except as required in Section 4.1.10 of these Regulations) to allow access to the well without encroaching on adjoining properties. Wells may be constructed less than ten (10) feet from a property line if prior approval is granted by the Department for the purpose of maximizing other horizontal separation distances as required by this Section.

4.1.1.2 For any parcel, lot, or subdivision created or recorded within fifty (50) feet of, or within the boundaries of, an Agricultural Lands Preservation District (as defined in Title 3 Del.C. Ch. 9); all wells constructed on such parcels shall be located a minimum of fifty (50) feet from any boundary of the Agricultural Lands Preservation District. This requirement does not apply to parcels recorded prior to the implementation date of these Regulations. However, it is recommended that all wells be placed the maximum distance possible from lands which are or have been used for the production of crops which have been subjected to the application of land applied federally regulated chemicals.

4.1.1.3 Wells shall not be permitted within any dedicated State of Delaware right-of-way unless written permission is obtained from the right-of-way holder and is submitted for review with the application, unless otherwise approved by the Department.

4.1.1.4 One hundred (100) feet from identifiable potential or existing sources of contamination, except that public and industrial water wells shall have a minimum separation of one hundred fifty (150) feet. Heat pump closed loop and heat pump recharge wells may be as close as fifty (50) feet to identifiable potential or existing sources of contamination, as stated in Sections 5.4.2 and 5.5.1 of these Regulations. The Department may consider approval of a lesser isolation distance from agricultural and irrigation wells on a case-by-case basis.

4.1.1.5 Fifty (50) feet from approved septic tanks, diversion valves or boxes, dosing chambers, holding tanks and grease traps, with the exception of public and industrial water wells where the minimum separation distance shall be one hundred fifty (150) feet.

4.1.1.6 Fifty (50) feet from any underground sewage force main. The isolation distance may be decreased to no less than ten (10) feet when the section of the sewer line within fifty (50) feet of the proposed well is double cased with watertight joints; or when the well is constructed into a confined aquifer.

4.1.1.7 Fifty (50) feet from any gravity sewer line. The minimum separation distance shall be decreased to ten (10) feet when the sewer line is constructed of SDR 35 polyvinyl chloride (PVC) pipe and the joints are watertight slip joints with rubber gaskets.

4.1.1.8 Unless otherwise approved by the Department, no industrial or public water well may be constructed within one hundred fifty (150) feet of any identifiable potential or existing source(s) of contamination as defined by these Regulations.

4.1.2 When any well, with the exception of industrial and public water wells, cannot be

~~physically placed the required isolation distance from identifiable potential or existing sources of contamination as specified in this section, the isolation distance may be decreased to no less than fifty (50) feet, but kept to a maximum possible distance, provided the well is screened in a confined aquifer and pressure grouted, as described in Section 4.7.11.3 of these Regulations, from at least ten (10) feet into the confining layer immediately above the source aquifer. Where the confining layer is less than ten (10) feet in thickness, the well shall be pressure grouted entirely through the confining layer. In areas where a confined aquifer does not exist within one hundred fifty (150) feet of the natural ground surface, the depth of the casing shall be at least one hundred (100) feet and the casing shall be grouted in accordance with the requirements of Section 4.7.11.4 of these Regulations. The final grout height in all cases shall be in accordance with the requirements of Section 4.7.11.7 of these Regulations.~~

~~4.1.3 A well may not be constructed within or under any building other than a separate structure constructed specifically for the housing of pumping equipment, unless otherwise approved in writing by the Department. Such structures shall be properly marked to indicate the classification of and the well permit number of the well contained therein.~~

~~4.1.4 Suction lines from wells shall be at least ten (10) feet from all identifiable potential or existing sources of contamination. However, if high water table conditions may submerge the suction pipe during any portion of the year, the suction pipe shall be at least fifty (50) feet from all identifiable potential or existing sources of contamination unless the suction line is double cased from the well to the pump.~~

~~4.1.5 Any subsurface pressure water supply line shall be at least ten (10) feet removed from any subsurface wastewater disposal area.~~

~~4.1.6 All wells shall be located so as to be accessible for cleaning, treatment, repair, testing, inspection, and any other such work as may be necessary.~~

~~4.1.7 All wells shall be protected from surface water run-off and flooding, as stated in Section 4.10 of these Regulations.~~

~~4.1.8 The Department may require special location and depth requirements for a proposed water supply well to minimize its exposure to potential or existing sources of contamination or interference with other water supply wells. Such requirements may include, but may not be limited to, the submission of drawdown data and capture zone analyses.~~

~~4.1.9 Wells subject to flooding, as defined in Section 5.2.1 of these Regulations, are subject to the additional siting requirements contained in Section 5.2.2 of these Regulations.~~

~~4.1.10 All public water wells within a housing development, subdivision, or strip development recorded on or after the implementation date of these Regulations shall be located at least one hundred fifty (150) feet within the subdivision or development's outermost property lines.~~

5.1.1 All wells, except for monitor, recovery, dewatering, observation wells, and soil borings, shall be sited to achieve maximum separation distance along the entire well, but no less than the distances listed below:

5.1.1.1 100 feet from identifiable potential or existing sources of contamination with the exception of public wells. Exceptions to these requirements for all wells other than public wells are addressed in Subsections 5.1.1.2, 5.1.1.3, 5.1.1.4, 5.1.1.5, 5.1.1.6, and 5.1.1.8. Public wells shall have a minimum separation distance of 150 feet except as addressed in Subsections 5.1.1.5, 5.1.1.6, and 5.1.1.7.

5.1.1.2 50 feet from identifiable potential or existing sources of contamination for heat pump recharge, heat pump closed loop, and heat pump direct exchange wells pursuant to Subsections 6.4.2 and 6.5.1.

5.1.1.3 50 feet from any boundary of an Agricultural Lands Preservation District (as defined in 3 *Del.C*. Chapter 9) for any parcel, lot, or subdivision. Wells on parcels, lots, or subdivisions created or recorded prior to April 6, 1997 are exempt. The Department requires that all wells be placed the maximum distance possible from lands where federally regulated chemicals have been applied.

5.1.1.4 100 feet from the absorption facility, 50 feet from septic tanks, diversion valves or boxes, dosing chambers, holding tanks, or grease, except as allowed by Subsection 5.1.2.

5.1.1.5 50 feet from any underground sewer forced main or gravity sewer lines but no less than ten feet if the well is constructed in a confined aquifer or if cased and grouted to a minimum of 100 feet below ground surface except public wells. Public wells shall be located the maximum distance possible allowed by the well site, but no less than 75 feet from an underground sewer forced main or gravity sewer lines. The Department may approve a lesser distance on a case by case basis for public well sites provided the well can be screened in a confined aquifer or can be cased and grouted at least 100 feet below land surface. Sewer laterals are not to be interpreted as forced main or gravity sewer lines.

5.1.1.6 50 feet from the absorption facility of a residential septic system that has been decommissioned as documented by the Department.

5.1.1.7 10 feet from a property line to allow access to the well without encroaching on adjoining properties except as required in Subsection 5.1.1.8. All wells may be constructed less than 10 feet from a property line if approved by the Department for the purpose of maximizing other horizontal separation distances as required by this Section and avoiding public utilities. The applicant shall provide a notarized form provided by the Department and signed by the property owner that documents the reason(s) for the request.

5.1.1.8 150 feet within the outer most property lines of the housing development for public wells within a housing development recorded on or after April 6, 1997.

5.1.2 When any well, with the exception of public wells, cannot be located at the separation distance pursuant to Subsection 5.1.1.4 the following shall apply:

5.1.2.1 The separation distance shall be maximized but no less than 50 feet, provided the well is screened in a confined aquifer and pressure grouted from either the top of the gravel pack to the ground surface, or from the bottom of the casing to the ground surface (e.g., crystalline rock, consolidated open-borehole wells), except those wells specifically exempted in Subsection 5.8.7. In the event that a confined aquifer is not encountered within 150 feet of the ground surface, the well will be required to be cased and grouted to a minimum of 100 feet below the ground surface unless more specific aquifer confinement is required by the Department.

5.1.2.2 Where any public water supply well cannot satisfy the separation distance requirements of Subsection 5.1.1.1, the Department at its discretion may approve an alternate siting and/or construction method(s) and must follow the requirements of Section 12.

5.1.3 No wells shall be located within any dedicated State of Delaware right-of-way unless a utility or safety permit is submitted with the application.

5.1.4 The Department may approve a lesser separation distance for an agricultural well from an existing or potential source of contamination but the separation distance shall be maximized and shall be no less than 50 feet.

5.1.5 Water Supply Lines

5.1.5.1 Pressure lines shall be at least 10 feet from all identifiable potential or existing sources of contamination. Pressure lines that must cross a gravity sewer line shall be double cased at least 10 feet on either side of the intersection of the water line with the gravity sewer.

5.1.5.2 Suction lines shall be at least 50 feet from all identifiable potential or existing sources of contamination.

5.1.5.3 Double-cased suction lines shall be at least 10 feet from all identifiable potential or existing sources of contamination.

5.1.5.4 A well may not be constructed within or under any building other than a structure constructed specifically for the housing of the well and related equipment, unless otherwise approved in writing by the Department. Such structures shall be identified on the exterior with the permit number of the well contained therein.

5.1.6 All wells shall be located so as to be accessible for cleaning, treatment, repair, testing, inspection, and any other work.

5.1.7 All wells shall be protected from surface water run-off and flooding pursuant to Subsection 5.11.

5.1.8 The Department may require special location and depth requirements for a proposed water supply well to minimize its exposure to identifiable potential or existing sources of contamination or interference with other water supply wells. The submission of drawdown data and capture zone analyses may also be required to justify the location and depth of the well.

5.1.9 Wells subject to flooding pursuant to Subsection 6.2.1 are subject to the additional siting requirements contained in Subsection 6.2.2.

~~4.2~~5.2 ~~Sanitary~~ Water Quality Protection During Well Construction

~~4.2.1~~5.2.1 During well construction~~,~~ of the well, the well and any ~~water bearing formation~~ aquifers shall be protected against contamination. ~~by any cause, including surface water drainage.~~

~~4.2.2~~5.2.2 Whenever construction stops ~~before the well is grouted and pumping equipment is installed,~~ prior to well completion, the open annular space or open borehole shall be covered and protected from surface water drainage. ~~and the~~ The well casing shall be capped in accordance with the requirements of ~~Section 4.10.4 of these regulations~~ Subsection 5.11.

~~4.2.3~~5.2.3 ~~In the event that contaminants are encountered during the drilling process, the well driller shall ensure that adequate precautions are taken to decontaminate the drilling and related apparatus to prevent the transfer of contaminants from the site.~~ Whenever contamination is detected during drilling, and the contamination was not anticipated by the Department and addressed in the permit conditions, the well driller shall cease work and notify the Department at (800) 662-8802. Drilling may commence upon approval by the Department.

~~4.2.4~~5.2.4 ~~Whenever contamination is observed during the drilling process, and the contamination was not anticipated or evaluated during the permit application and~~

approval process, the well driller shall cease work and notify the Department immediately. If contaminants are encountered during drilling, the well driller shall decontaminate the drilling equipment to prevent the transfer of contaminants into uncontaminated aquifers or from the site.

4.35.3 Water and Wells for Well Construction

4.3.15.3.1 Water used during the for well construction of any potable well shall be obtained from sources listed in Section 4.3.3.1, 4.3.3.2 or 4.3.3.3 of these Regulations. from sources other than those listed below is prohibited:

4.3.2 Water used during construction of any non-potable well shall be secured from the best and closest source available. For purposes of this Section, the closest source may be considered from one (1) to five (5) miles depending on road conditions and the quality of water required.

4.3.3 The best water source for construction purposes in order of preference shall be:

4.3.3.15.3.1.1 A public water supply system meeting the requirements of the "Delaware Regulations Governing Public Drinking Water Systems." If the water is transported to the site in a receptacle, it shall be disinfected in accordance with Section 4.3.6 of these Regulations prior to use.

4.3.3.25.3.1.2 Any other potable water supply. If the water is transported to the site in a receptacle, it shall be disinfected in accordance with Section 4.3.6 of these Regulations prior to use.

4.3.3.35.3.1.3 Other non-potable water supply wells such as wells used for irrigation or construction wells. fire fighting, or well construction. If the water is transported to the site in a receptacle, it shall be disinfected in accordance with Section 4.3.6 of these Regulations prior to use.

4.3.4 Water from sources other than those listed in Section 4.3.3 shall not be used for well construction.

4.3.5 Construction water used in mixing drilling fluids and grout need not be disinfected prior to use.

4.3.65.3.2 Disinfection of water Water used for well construction shall be accomplished disinfected as follows:

4.3.6.15.3.2.1 For water Water from an existing a potable drinking water source, a chlorine compound shall be added to the water to produce maintained with a free residual chlorine residual of one (1) milligrams per liter (mg/L).

4.3.6.25.3.2.2 For Water from a non-potable well, disinfection shall be accomplished by mixing disinfected with one (1) gallon of sodium hypochlorite pound of calcium hypochlorite (or an equivalent amount of calcium hypochlorite) to each one thousand (1000) per 1,000 gallons of drilling water. At least thirty(30) 30 minutes contact time shall lapse elapse between addition of the disinfectant and use of the water. as drilling fluid. NOTE: Sodium hypochlorite in the form of laundry bleach contains (5.25 percent available chlorine) may be used in lieu of calcium hypochlorite. One and seven tenths (1.7) gallons of laundry bleach is are equivalent to one (1) pound of dry calcium hypochlorite.

5.3.3 Well Construction Wells

5.3.3.1 The Department may issue a permit for a construction well to supply water for a new well installation. The application for a construction well should be submitted in conjunction with the application for a new well.

5.3.3.2 All construction wells shall be sealed pursuant to Section 10.0 prior to the demobilization ~~of~~ the drill rig.

5.4 Drilling Fluids

5.4.1 Drilling fluids shall consist of water-based or air-based fluids containing only additives manufactured for water well drilling.

5.4.1.1 If rapid loss of drilling fluid occurs, clean fill material such as sand, gravel, crushed stone, or drilling fluid additives manufactured for lost circulation may be used in the zone or zones where the loss is occurring.

5.4.2 The Department may set drilling fluid specifications for fluid viscosity and specific gravity. The Department may require that a report of drilling fluid characteristics be submitted with the completion report.

5.4.3 The use of polymers is permitted to increase viscosity and filtration control in drilling fluids.

~~4.4~~5.5 Well Casing

~~4.4.1~~5.5.1 ~~All types of casing used for well construction shall be approved by the National Sanitation Foundation, The American Society for Testing and Materials, or by the Department for use as well casing.~~ Well casing shall be strong enough to resist the forces imposed on it during and after installation, following applicable specifications established by the American Petroleum Institute, American National Standards Institute, and the American Society for Testing and Materials.

~~4.4.2~~5.5.2 ~~Any well casing materials which cause the delivered water to be toxic or violate state or federal drinking water standards are not permitted.~~ Casing must not cause the delivered water to be toxic or violate state or federal drinking water standards, following the specifications established by the National Sanitation Foundation.

~~4.4.3~~5.5.3 ~~Well~~ Casing other than ~~thermoplastic~~ polyvinyl chloride (PVC) or steel shall only be used with the written approval of the Department.

~~4.4.4 All thermoplastic well casing used in the construction of wells shall have a strength rating which is equal to or greater than Schedule 40 in the same diameter, unless otherwise approved by the Department. For wells with a diameter greater than six (6) inches it is the responsibility of the water well contractor to take into account special conditions that may require heavier weight well casing (i.e., installation depth, cementation of sediments, water quality, etc.).~~

5.5.4 Polyvinyl chloride (PVC) casing shall be a minimum of Schedule 40 unless otherwise approved by the Department.

5.5.5 For wells with a diameter greater than six inches, the water well contractor shall account for conditions such as installation depth that may require heavier-weight well casing.

~~4.4.5~~5.5.6 Steel ~~well~~ casing shall be used ~~in~~ for wells constructed in crystalline rocks.

~~4.4.6~~5.5.7 Steel ~~well~~ casing ~~up to and including a nominal size of six (6) inches~~ shall be a minimum of at least Schedule 40~~. For wells larger than six (6) inches in diameter the minimum wall thickness is 0.280 inches unless prior written approval is granted~~ unless otherwise approved by the Department.

~~4.4.7~~5.5.8 ~~Other sizes of well casing may be approved by the Department upon receipt of a written request from the water well contractor.~~ The Department may require that

casing used for water supply wells be at least four inches in diameter. The Department may require that casing used for public supply wells be at least six inches in diameter.

~~4.4.8~~5.5.9 Well Casing Lengths

~~4.4.8.1~~5.5.9.1 ~~Less than twenty (20) feet of casing shall not be used in any well.~~ Overall casing length shall be no less than 20 feet. Monitor, observation, recovery, wick drains, dewatering, and large diameter bored wells are excluded from this requirement. Required casing heights above ground surface are specified in ~~Section 4.10 of these regulations~~ Subsection 5.11.

~~4.4.8.2~~5.5.9.2 Wells (except ~~wick drains,~~ monitor, observation, dewatering, and recovery wells) ~~constructed~~ located on tax parcels less than one-half acre in size and ~~on which~~ where an on-site wastewater treatment and disposal system is or will be utilized, shall be cased to a minimum depth of ~~forty- two (42)~~ 42 feet below land surface.

~~4.4.8.3 For wells constructed in unconsolidated sand and gravel deposits, the casing shall extend to the top of or into the aquifer used.~~

~~4.4.8.4 For wells constructed in crystalline rock the casing shall extend through the weathered zone and be seated at least ten (10) feet into bedrock.~~

~~4.4.8.5 When SDR (standard dimensional ratio) thermoplastic casing is used, the wall thickness should be at least equal to or greater than the wall thickness of schedule 40 thermoplastic casing in the same diameter. The following table is intended as a guide in the selection of thermoplastic casing.~~

~~THERMOPLASTIC CASING SELECTION GUIDE Diameter Recommended Maximum Depth (Feet) Inches Sch. 40 Sch. 80 SDR 21 SDR 19 SDR 17 SDR 13.5 2 875 1500 * ** 1325 3 6751500 * * * 1325 4 450 1050 * 450 625 1325 4.5 375 950 * 450 625 1325 5 300 875 325 450625 1325 6 225 700 325 450 625 1325~~

~~* Not Recommended in diameter indicated~~

~~NOTE: SDR (standard dimensional ratio) = casing outside diameter, wall thickness.~~

5.5.9.3 Wells completed in a confined aquifer shall be cased to the top of or into the source aquifer.

5.5.9.4 Wells sited pursuant to Subsection 5.1.1.6 shall be cased to a minimum depth of no less than 42 feet below land surface.

~~4.4.9~~5.5.10 Other Well Casing Requirements

~~4.4.9.1~~5.5.10.1 Joints for all well casing shall be water tight and joined in accordance with the manufacturer's recommendations. Joints for steel well casing ~~may~~ shall be electrically welded or threaded. Joints for ~~thermoplastic well casing may~~ polyvinyl chloride (PVC) well casings shall be ~~threaded or coupled with~~ solvent ~~welding~~ welded or threaded. ~~Solvent-weld joints for thermoplastic well casing shall be allowed to set to attain sufficient structural strength before the casing is installed in the bore hole.~~ All couplings and solvents shall meet ANSI/NSF Standard 14, ASTM F480 or similar requirements.

~~4.4.9.2 Temporary well casing and liners shall be of such minimum thickness as required to withstand the structural load imposed by conditions inside and outside the well.~~

~~4.4.9.3~~5.5.10.2 ~~No well casing shall be cut off or cut below ground except:~~ Casing must not be cut off below ground level pursuant to Subsection 5.11.8,

or

~~4.4.9.3.1~~5.5.10.2.1 ~~to~~To install a pitless unit or pitless adapter, or

~~4.4.9.3.2~~5.5.10.2.2 ~~to~~To install a standard plumbing "Tee", or

~~4.4.9.3.3~~5.5.10.2.3 ~~to~~To install an outer casing to terminate just below a pitless adapter or standard plumbing "Tee" connection, ~~which~~ that is on the inner casing, or

~~4.4.9.3.4~~5.5.10.2.4 ~~for~~For ~~abandonment~~ sealing purposes.

~~4.4.9.4~~5.5.10.3 ~~In crystalline rock where~~ Where steel well casing is required, the ~~well~~ casing shall be equipped with a ~~"~~drive shoe~~"~~ ~~which~~ that shall be firmly seated by driving it into the rock prior to continuation of drilling or grouting.

~~4.5~~5.6 Well Screens

~~4.5.1~~5.6.1 All wells ~~which~~ that obtain water from unconsolidated aquifers shall be equipped with a well screen that will limit the entrance of ~~sediment material into the well following development and completion.~~ sediments.

~~4.5.2~~5.6.2 Wells finished in consolidated aquifers ~~where the bottom of the well casing is at a depth where the formation will not collapse because of pumping,~~ are not required to be screened.

~~4.5.3~~5.6.3 Well screens shall have sufficient structural strength ~~to accomplish the purpose for which they are installed.~~ appropriate for the installation.

~~4.5.4~~5.6.4 ~~The well screen openings (slots) shall provide, so far as is practicable, the maximum amount of open area, consistent with the strength of the screen material and sediment grain size (gradings) of the water-bearing formation to permit maximum transmission without clogging.~~ The screen shall be sized to meet the screen manufacturer's specifications.

~~4.5.5~~5.6.5 Only ~~machine~~ commercially manufactured well screens, constructed of materials resistant to damage by chemical action of groundwater or cleaning agents, shall be used in the construction of a well, unless otherwise approved by the Department.

~~4.5.6~~5.6.6 ~~Well screens shall be provided with fittings necessary to seal the well screen to the well casing.~~ Lead packers and lead swedges are prohibited.

~~4.5.7~~5.6.7 ~~A fitting shall be provided to close the~~ The bottom of the well screen shall be closed.

~~4.5.8~~5.6.8 ~~Screening of more than one aquifer shall not be allowed in any well. The Department may consider an exception to this requirement in the case of wick drain construction, on a case-by-case basis.~~ Aquifer interconnection, as determined by the Department, is prohibited.

~~4.6~~5.7 Gravel Packed Wells

~~4.6.1 Gravel which is packed in annular spaces shall be washed with water and free of clay, silt, and organic material.~~

~~4.6.2 The gravel pack shall not contain iron or manganese in concentrations that will adversely affect the quality of water withdrawn from the well.~~

~~4.6.3 It is recommended that gravel stored at the drilling site be stored on a clean plastic~~

~~or other clean surface to prevent mixing with soil materials.~~

~~4.6.4 The gravel pack may be emplaced by simply placing gravel down the annulus, by placing a water-gravel mix down the annulus or by using a tremie pipe where a water-gravel mix is emplaced at the bottom of the annulus and by slowly raising the tremie pipe.~~

~~4.6.5 Gravel packs may not connect different aquifers.~~

5.7.1 Gravel shall be free of foreign matter, well sorted, and properly sized. The gravel shall be disinfected as it is placed into the well annulus in one continuous operation.

5.7.2 Bulk gravel shall be covered and stored to prevent direct contact with the ground.

5.7.3 The placement of gravel into the annulus shall completely encase the well screen and prevent grout from entering the screen after settlement. The Department may require gravel placement with a tremie pipe, as needed.

5.7.4 Placement of gravel that causes interconnection of aquifers, as determined by the Department, is prohibited.

5.7.5 Gravel must not extend more than 10 feet above the top of the screen in single cased wells unless otherwise approved by the Department.

5.7.6 Gravel may be used to fill the annulus of geothermal closed loop wells from the bottom of the borehole to the bottom of the overburden only in the Piedmont physiographic province.

~~4.7~~5.8 Well Grouting

~~4.7.1~~5.8.1 All wells ~~having annular spaces~~ shall be grouted from the top of the gravel pack to the ground surface unless specifically exempted in ~~this Section~~ Subsection 5.8.7 or otherwise approved by the Department.

~~4.7.2~~5.8.2 The ~~annular space of all wells to be grouted~~ annulus shall be a minimum of ~~one and one half (1.5)~~ 1.5 inches wide (diameter of bore hole equal outside diameter of casing plus three ~~(3)~~ inches).

~~4.7.3~~5.8.3 All wells shall be grouted ~~as soon as possible, but not later than twenty four (24)~~ 24 hours after the ~~well~~ casing has been set. ~~in place and all construction operations have been completed.~~

~~4.7.4 All wells having annular spaces (with the exception of monitor, observation, and dewatering wells with casing depths of twenty (20) feet or less, and temporary wells for well construction) shall be pressure grouted.~~

~~4.7.5 Monitor and observation wells and temporary wells for well construction may be grouted by pouring grout down the well annulus, if pressure grouting is impractical.~~

~~4.7.6 Dewatering wells with casing depths less than twenty (20) feet which are constructed by either washing or driving the casing, need not be grouted.~~

5.8.4 Wells 40 feet or less in depth that are constructed in unconfined aquifers, may be grouted by pouring chipped or pelletized bentonite into the annulus. For wells deeper than 40 feet in depth, the annulus shall be pressure grouted from top of the gravel pack to ground surface. For exceptions, see Subsection 5.8.13.2.

5.8.5 For single-cased wells constructed in confined aquifers, the casing shall be pressure grouted from the top of the gravel pack to ground surface.

5.8.6 Geothermal closed loop and direct exchange wells shall be pressure grouted from

the bottom of the bore hole to the ground surface.

5.8.7 Wells with casing depths of 20 feet or less are not required to be grouted, except monitor, observation, recovery wells, and wick drains less than 20 feet in depth may be required to be grouted.

5.8.8 The use of drill cuttings between the gravel pack and the required grout depth for domestic, public, and heat pump supply (potable) is prohibited.

~~4.7.7~~5.8.9 The water well contractor may be required to notify the Department in advance of grouting. ~~wells to provide the Department the opportunity to observe the procedure. Such condition shall be specified on the well permit. The well driller is not required to stop work to wait for Department staff unless the permit states otherwise.~~ If the Department has scheduled a grouting inspection, the driller is not permitted to proceed with grouting unless otherwise instructed by the Department.

~~4.7.8~~5.8.10 ~~After grouting is Completed~~ Cement grout ~~shall~~ must be allowed to cure ~~in accordance with manufacturer's recommendations~~ for a minimum jof 24 hours from the completion of grouting before well construction activity, including development, can be resumed.

~~4.7.9~~5.8.11 The Department ~~shall have the right to require special~~ may specify additional conditions pertaining to the grouting of any well. ~~These requirements shall be specified on the well permit.~~

~~4.7.10~~5.8.12 Grouting ~~Materials~~

~~4.7.10.1~~5.8.12.1 Cement ~~the annular space~~ may be ~~filled with~~ neat Portland or quick setting (hi- early) cement in a ratio of ~~not over six (6)~~ no more than six gallons of water per ~~ninety four (94)~~ 94 pound ~~sack~~ bag of cement. ~~or as otherwise permitted by the Department following a written request and justification. A~~ Sodium based bentonite ~~clay~~ may be added to the cement grout in an amount not to exceed five ~~(5)~~ pounds per ~~ninety-four (94)~~ 94 pound ~~sack~~ bag of cement. ~~When adding bentonite clay to Portland cement grout, additional water shall be allowed at a rate of one (1) to two (2) gallons of water to one (1) pound of bentonite.~~

~~4.7.10.2~~5.8.12.2 Bentonite ~~Clay~~ ~~A~~ grout is a sodium-based bentonite ~~clay may be used to fill the annular space in both the confined and unconfined unconsolidated sand and gravel aquifers in~~ with a ratio of not less than ~~one and one-half (1.5)~~ two pounds of bentonite ~~clay~~ per gallon of water. ~~or according to the manufacturer's specifications. It is recommended that a ratio of at least two (2) pounds of bentonite per gallon of water be used. It is also recommended that~~ Bentonite clay without additives shall not be used where it comes in contact with ground waters groundwater with a pH ~~below five (5.0)~~ less than five or having a total dissolved solids content greater than ~~one thousand (1,000)~~ 1,000 milligrams per liter (mg/L)~~, or according to the manufacturer's specifications.~~ without Department approval.

5.8.12.3 Thermally enhanced bentonite grout is a sodium-based bentonite silica sand mixture with a ratio of not less than 1.5 pounds of bentonite per gallon of water containing no more than 300 pounds of sand per 50 pounds of bentonite. Sand shall be "000" well gravel or range between 50 and 70 mesh containing a minimum of 95% silica having a uniformity coefficient not greater than 1.7.

~~4.7.10.3~~5.8.12.4 If rapid loss of grout material occurs during emplacement,

clean ~~coarse~~ fill material such as sand, gravel, crushed stone, or ~~dry~~ cement additives manufactured for lost circulation may be used in the zone ~~or zones in which~~ where the loss is occurring.

5.8.12.5 Use of polymers is permitted to slow the hydration of bentonite.

5.8.12.6 All water used for grouting shall be treated with soda ash (sodium carbonate (Na2C03)) to achieve a minimum pH of 8.0

~~4.7.11~~5.8.13 Standards for Grouting

~~4.7.11.1~~5.8.13.1 Well grouting shall be performed to provide a water tight seal ~~through the annular spaces of a well to prevent~~ that prevents fluid migration ~~through~~ into the annulus of the well.

~~4.7.11.2 The annular spaces of all wells, except for the wells exempted in Section 4.7.4 of these Regulations, shall be pressure grouted to a depth of at least eighteen (18) feet. Monitor, observation, recovery, and large diameter bored wells may be grouted to a lesser depth depending on the length of the casing. The Department may require grouting to a greater depth. All wells constructed on a parcel less than one-half acre in size and which is or will utilize an on-site wastewater disposal system shall be grouted to a minimum depth of forty (40) feet.~~

~~4.7.11.3 For wells penetrating confined, unconsolidated sand and gravel aquifers, the annular space shall be pressure grouted from at least ten (10) feet into the confining layer, immediately above the source aquifer. Where the confining layer is less than ten (10) feet in thickness, the well shall be pressure grouted entirely through the confining layer. The final grout height shall be in accordance with the requirements of Section 4.7.11.7 of these Regulations.~~

~~4.7.11.4 Wells installed with a minimum casing depth of one hundred (100) feet, as provided for in Section 4.1.2 of these Regulations, shall be grouted from a minimum of five (5) feet above the screen to a point on the casing in accordance with the requirements of Section 4.7.11.7 of these Regulations.~~

5.8.13.2 All single-cased wells shall be grouted from either the top of the gravel pack to the ground surface, or from the bottom of the casing to the ground surface (e.g., crystalline rock, consolidated open-borehole wells), except those wells specifically exempted in Subsection 5.8.7.

~~4.7.11.5~~5.8.13.3 If the annular space cannot be grouted in accordance with these Regulations, the well shall be ~~abandoned in accordance with~~ sealed pursuant to ~~Section 9 of these regulations~~ Section 10.

~~4.7.11.6 Deviation from the grouting standards may be approved by the Department for unusual conditions which prevent conformance to these standards. This permission shall be in writing from the Department and secured prior to grouting.~~

~~4.7.11.7~~5.8.13.4 ~~The final grout height shall be between ground surface and a point on the casing corresponding to the base of the pitless adapter, pitless unit, or plumbing "Tee". The grout may be extended at the time of grouting to ground surface and allowed to settle to, but not below, the base of the pitless adapter, pitless unit, or plumbing "Tee", or grout may be placed to the base of the pitless adapter, pitless unit, or plumbing "Tee", and more grout added to maintain~~

~~the required minimum height until settling ceases.~~ The top of grout shall be at the base of the well's discharge line for wells equipped with pitless adapters, pitless well unit, or plumbing "Tees".

~~4.7.11.8~~ ~~Monitor and observation wells shall be grouted in accordance with Section 5.1 of these Regulations or according to special permit conditions as stipulated on the permit.~~

5.8.13.5 Grouting requirements for multiple-cased wells shall be determined on an individual basis.

~~4.8~~5.9 Well Development

~~4.8.1~~5.9.1 ~~Well~~ Development shall ~~consist of cyclic or intermittent pumping, surging, or both, either mechanically or by using water or air under pressure. Development shall continue~~ be performed until formation cuttings, mud, and drilling fluids ~~and~~ or other additives are completely removed from the well and surrounding aquifer. ~~All wells shall be developed to remove the fine sands, silts, clays and rock particles from the aquifer surrounding the well screen or intake interval such that the water pumped from the well meets the following requirements:~~

~~4.8.1.1 Contains less than five (5) milligrams of sand or larger particles per liter of water. Particles with a diameter between 0.0625 and 2.0 millimeters shall be considered sands.~~

~~4.8.1.2 Have a turbidity of less than ten (10) NTU (Nephelometric Turbidity Units), except that when the turbidity is due to the oxidation of dissolved iron or manganese naturally occurring in the water. The well may be put into service if it is not reasonably pos sible to produce water from another aquifer and treat ment is not legally or technically possible.~~

~~4.8.2 Monitor and observation wells shall be developed as specified in Section 4.8.1 of these Regulations, unless otherwise approved by the Department.~~

5.9.2 All potable wells shall be developed such that the water meets the following requirements:

5.9.2.1 Contains less than one milligram of sand or larger particles per liter of water (particles with a diameter larger than 0.0625 millimeters);

5.9.2.2 Has a turbidity of less than 10 NTU (Nephelometric Turbidity Units), except when the turbidity is due to the oxidation of naturally occurring dissolved iron or manganese.

~~4.9~~5.10 Pitless Well Adapters, Pitless Well Units, and Plumbing "Tees"

~~4.9.1~~5.10.1 ~~Pitless~~ A pitless well ~~adapters~~ adaptor or pitless well ~~units~~ unit shall be installed on all potable wells having a submersible pump or deep well ejector jet pump. ~~which utilizes an underground discharge.~~

~~4.9.2~~5.10.2 For suction lift systems where the well casing is used as a suction line and for heat pump recharge wells, a standard plumbing "Tee" connector and extension pipe with cap may be used in place of a pitless well adapter or pitless well unit, providing the extension meets the requirements ~~of Section 4.10 of these Regulations~~ pursuant to Subsection 5.11.

~~4.9.3~~5.10.3 All pitless well adapters or pitless well units shall be of a type approved by the National Sanitation Foundation, the Water Systems Council, or the Department.

~~4.9.4~~5.10.4 Connections of the pitless well adapter, pitless well unit, or plumbing "Tee" to the well casing and lateral connections of piping shall be watertight. ~~To assure a~~

~~watertight connection between the well casing and the pitless well adapter or pitless well unit, care shall be exercised in cutting the hole in the well casing. It is recommended that a metal cutting hole saw and template be used. After the use of a metal cutting hole saw, all burrs resulting from the cutting operation shall be removed. If an acetylene torch is used in the cutting operation, all slag shall be removed, and both inside and outside surfaces of that portion of casing surrounding the hole shall be smooth.~~

~~4.9.5~~5.10.5 A pitless well adapter, pitless well unit or plumbing "Tee" shall be installed in conformance with depth of water service piping requirements ~~referenced in Section 3.22 of these Regulations~~ pursuant to Subsection 3.21.

~~4.10~~5.11 Well Caps and ~~Upper Terminus of Wells~~ Well Heads

~~4.10.1 The well casing, pitless well adapter or pitless well unit may not terminate less than eight(8) inches above the finished ground surface or pump house floor for domestic, miscellaneous public, and agricultural wells unless otherwise approved by the Department.~~

~~4.10.2 All other wells, with the exception of monitor, observation and closed loop heat pump wells and piping systems, shall terminate not less than twelve (12) inches above the finished ground surface. Monitor and observation wells may be excluded from this requirement with the written approval of the Department. Wells constructed in coastal or flood prone areas as defined in Section 5.2.1, shall be completed in accordance with Section 5.2.3 of these Regulations. Alternative construction methods may be approved by the Department.~~

~~4.10.3 Closed loop heat pump well piping systems shall be connected to the dwelling in accordance with manufacturer's recommendations and all local building and plumbing codes. Closed loop heat pump well systems are not required to terminate above the finished ground surface.~~

~~4.10.4 All wells shall be covered with a secure well cap. Vented capping devices shall be screened so as to be insect and vermin proof. The well cap shall be locked or incapable of being removed without the use of tools. The Department may consider approval of alternative methods for capping irrigation and agricultural wells while mobile pumping equipment is in use. When the mobile pumping equipment is removed, the well shall conform to the requirements of these Regulations.~~

~~4.10.5 Use of buried well seals, well pits, or other devices, including buried "sanitary well seals" to cap wells below ground surface and provide access for electrical cable and water pipe are prohibited unless prior written approval has been granted by the Department.~~

5.11.1 For flood-prone wells, the top of the well head or pitless well unit shall be no less than 24 inches above ground surface, or the highest known flood level, whichever is greater.

5.11.2 For domestic and agricultural wells, the top of the well head, or pitless well unit shall be no less than eight inches above the finished ground surface or pump house floor unless otherwise approved by the Department.

5.11.3 For monitor and observation wells, the top of the well head, except as provided by Subsection 5.11.6, shall be no less than 24 inches above the finished ground surface except as required by Subsection 6.1.3. The casing shall be protected from entry by contaminants, vandalism, accidental damage, etc. The required protection devices are:

5.11.3.1 A locking well cap.

5.11.3.2 For PVC casing – a concentric, protective steel casing firmly set in

concrete. The Department may waive this requirement for specific projects (such as, small on-site wastewater treatment and disposal systems).

5.11.4 For public, irrigation, and industrial wells, the top of the well head or pitless well unit shall be no less than 18 inches above the finished ground surface.

5.11.5 For wells and well points used for dewatering, the top of the well head or takeout shall be no less than 12 inches above the finished ground surface.

5.11.6 Monitor and observation wells may be terminated below finished ground surface upon approval by the Department.

5.11.7 The Department may require additional protective devices such as bollards in high traffic areas.

~~4.10.6~~5.11.8 ~~Pump pits, as defined in Section 2.47 of these Regulations, are prohibited.~~ Well pits, pump pits and buried well seals are prohibited. Upon approval by the Department, potable wells may be terminated below finished ground surface if above grade completion is not feasible. The engineered design of the enclosure must be included with the application or submitted prior to modification of an existing well.

5.11.9 All wells shall be securely covered except during construction and testing. Caps shall be lockable or removable only with tools. If a cap cannot be used, an alternative method for securely covering the well shall be employed.

~~4.10.7~~5.11.10 Any time an existing well ~~which does not meet~~ is identified as not meeting the requirements of this Section, ~~is accessed for any reason,~~ the ~~upper terminus~~ well head shall be brought into compliance ~~with the requirements of this Section,~~ unless otherwise approved by the Department. Wells permitted prior to the effective date of these Regulations are exempt. The Department may impose these requirements upon the reclassification of any well.

~~4.11~~5.12 Water Level Access Ports and Tubes

~~4.11.1~~5.12.1 All wells with a pumping capacity greater than ~~fifty thousand (50,000)~~ 50,000 gallons per day shall be constructed with ~~a port and~~ an access port and tube. ~~Irrigation wells are not required to be equipped with an access tube.~~

~~4.11.2~~5.12.2 ~~All public wells which supply a community water system and are completed in a confined aquifer, and all industrial wells completed in a confined aquifer shall have an access port equipped with a removable cap or plug and tube through which a water level measurement can be made.~~ All public wells that supply a community water system and all industrial wells shall have a capped access port and tube. A transducer may be installed in addition to the access port and tube.

~~4.11.3~~5.12.3 If the pump motor is not installed directly over the well, the access port shall be located directly on top of the well.

~~4.11.4~~5.12.4 If the pump motor is installed directly over the well, an access port pipe shall be installed through the pump base or outside the well casing at some accessible point below the base of the pump.

~~4.11.5~~5.12.5 The access port and tube shall have a minimum inside diameter of ~~one half (0.5)~~ three-quarters inch. ~~so that the position of the water level may be determined by measurement with a steel or electric tape. The access port and tube shall be equipped with a removable cap or plug.~~

~~4.11.6~~5.12.6 The access port shall be ~~installed and plugged in a manner which~~ constructed to ~~prevents~~ prevent the entrance of water, dust, insects, or other foreign material, and ~~permits ready~~ allow access for water level measurements.

~~4.11.7~~5.12.7 ~~Airline gauges are not acceptable water level measurement devices.~~ The use of airline gauges for water level measurement is prohibited.

~~4.12~~5.13 Meters, Pumping Equipment, and Vents

~~4.12.1~~5.13.1 All wells with a design capacity greater than ~~fifty thousand (50,000)~~ 50,000 gallons per day shall be permanently equipped with a meter~~(s)~~ or meters capable of acquiring instantaneous flow rate and totalized flow measurements accurate to within ~~plus/minus~~ five percent ~~(+/- 5%)~~ of the actual flow rate, unless otherwise approved by the Department or pursuant to Subsection 5.13.2. . Flow rate indicators may consist of any combination of test dials and direct reading indicators. ~~Elapsed timers are not acceptable flow metering devices except as noted in Section 4.12.2 of these Regulations.~~

~~4.12.2~~5.13.2 Irrigation wells~~, agricultural wells,~~ and non-potable wells constructed and used for fire protection ~~purposes only and which have~~ with a design capacity greater than ~~fifty thousand (50,000)~~ 50,000 gallons per day shall be permanently equipped with an elapsed time meter, readable in hours or minutes, equipped on the well's drive engine or motor to measure actual hours of operation. If an irrigation well has been determined by the Department to be located in an area of concern such as areas of very high groundwater use or saltwater intrusion, the Department may require the well to be permanently equipped with a meter or meters capable of acquiring instantaneous flow rate and totalized flow measurements accurate to within 5 percent of the actual flow rate.

5.13.3 All public and industrial wells shall be permanently equipped with a meter capable of acquiring instantaneous flow rate and totalized flow measurements accurate to within five percent of the actual flow rate, unless otherwise approved by the Department.

~~4.12.3~~5.13.4 A backflow protection device shall be installed in a pumping system ~~where the pumping equipment is used to apply wastewater, fertilizers, or chemicals, and where the pumping equipment is also connected to a water well.~~ containing a well if the pumping system is connected to a treatment system, is used to convey wastewater, fertilizers, chemicals, or provides fire protection pursuant to Subsection 6.3.3.

~~4.12.4 The pump capacity shall be consistent with the intended use and yield characteristics of the well~~.

~~4.12.5 Installation of the pump shall be in accordance with manufacturer's instructions.~~

5.13.5 Water systems that draw from more than one aquifer shall have a backflow prevention device on the discharge line of each well to prevent the introduction of water that is not native to the source aquifer.

5.13.6 The proposed withdrawal rate shall be consistent with the pump capacity, well design, and the intended use of the well.

~~4.12.6~~5.13.7 Well vents shall be ~~screened and positioned~~ covered with corrosion-resistant mesh screen and down-turned to prevent the entrance of surface water, ~~dust,~~ insects, or other foreign material.

~~4.12.7~~5.13.8 Upon completion of installation, ~~the person installing the pump~~ the driller or pump installer shall disinfect the well and pump pursuant to ~~Section 6~~ Section 7.

~~5.0~~6.0 Special Construction Requirements

~~5.1~~6.1 Monitor and Observation ~~Well Construction~~ Wells

~~5.1.1 Unless otherwise approved by the Department, monitor and observation wells shall conform to standard well construction requirements and other general requirements~~

~~as specified in these Regulations.~~

~~5.1.2 In circumstances where special monitor and observation well construction specifications are necessary to protect the public health, safety, or environment, the Department may require additional specifications for monitor and observation well construction.~~

6.1.1 Well construction materials and methods must be compatible with the monitoring program objectives

~~5.1.3~~6.1.2 ~~Monitor~~ Wells ~~shall~~ must be constructed ~~by a method which allows for the determination of characteristics of the geologic materials under the site unless otherwise approved by the Department.~~ to allow for characterization of geologic materials and sampling. The Department may place additional requirements on wells that are used as part of a specific environmental program.

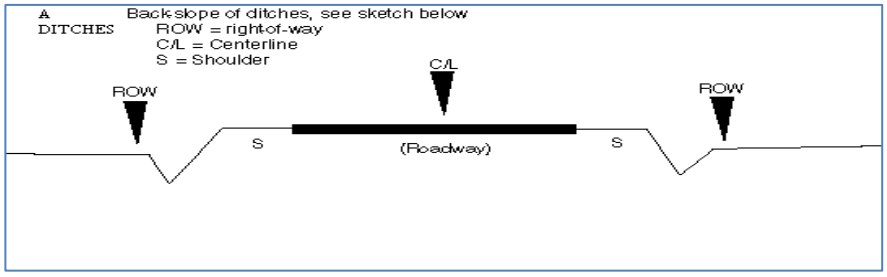
~~5.1.4 Unless otherwise approved by the Department, the annular spaces of monitor and observation wells with casing depths exceeding twenty (20) feet below ground surface shall be pressure grouted from the top of the gravel pack to the ground surface. Other grouting methods capable of completely sealing the annular space are acceptable for wells with casing depths less than or equal to twenty (20) feet below the ground surface.~~

~~5.1.5 The Department has prepared monitor well construction guidelines, which are available upon request, to assist in planning monitor wells and completing the monitor well permit application.~~

6.1.3 Wells located within a Delaware Department of Transportation (DelDOT) right-of-way must be enclosed in a curb box, flush mounted with the ground surface with a six-inch wide cement apron around the perimeter of the curb box. No well shall be placed on highway travel lanes, on auxiliary travel lanes or on roadway shoulders. The well owner is responsible for having these wells sealed upon notification from either the Department or DelDOT.

6.1.4 Applications for wells in areas described in this Section must have the words "Zone of Interest" clearly marked on the application.

6.1.4.1 Ditches:



6.1.4.2 Telephone poles and DelDOT fence lines.

6.1.4.3 Two feet between the sidewalk and road from the roadside edge of the sidewalk.

6.1.4.4 Highway signs.

6.1.5 PVC screens for monitoring petroleum hydrocarbons must have a slot width no less than 0.020 inches. Screens for all other applications must have a slot width no less than 0.010 inches.

6.1.6 Monitor wells must not be disinfected without prior written approval from the Department, except for monitor wells used for bacterial sampling.

6.1.7 In the event that contaminants are encountered during the drilling process, the water well contractor shall decontaminate the drilling rig and related apparatus to prevent the transfer of contaminants from the site.

6.1.8 Contaminated fluids and drill cuttings derived from drilling, developing, or sampling of monitor wells shall be properly containerized and disposed of by the water well contractor or other designated party.

6.1.9 The Department may require the elevations of the tops of monitoring and observation wells, excluding the caps, be established with reference to mean sea level datum or a common datum, as appropriate, to determine the direction of groundwater flow and related groundwater elevations to other available points. The surface used for this measurement must be permanently marked.

~~5.2~~6.2 ~~Coastal Well Construction~~ Flood Zone Wells

~~5.2.1~~6.2.1 ~~Special construction~~ Standards ~~as~~ set forth in this Section are for wells in areas prone to wave action or flooding. These coastal areas are shown on Flood Insurance Rate Maps published by the Federal Emergency Management Agency and are designated as "A" or "V" zones.

6.2.2 Wells constructed in flood-prone or coastal areas shall be completed pursuant to Subsection 5.11.1.

~~5.2.2~~6.2.3 Wells ~~described in 5.2.1 above and~~ constructed on waterfront properties shall be constructed on the landward side of the property, ~~if possible.~~ unless otherwise approved by the Department.

~~5.2.3 Wells shall be finished at least two (2) feet above ground surface.~~

6.2.4 Well construction beyond the Department's coastal building restriction line as defined in the Delaware Regulations Governing Beach Protection and the Use of Beaches is prohibited.

~~5.3~~6.3 Public~~, Miscellaneous Public~~ and Industrial ~~Well Construction~~ Wells

~~5.3.1 All miscellaneous public, industrial, and public water wells as defined in Section 2 of these Regulations, shall be installed by such a method that will allow proper construction and grouting of the well according to applicable Regulations contained herein.~~

~~5.3.2 Test wells may be converted for public, miscellaneous public or industrial production well purposes, in accordance with Section 3.21 of these Regulations. The Department reserves the right to add additional requirements to the permit if it is converted to permanent status.~~

~~5.3.3 Department personnel shall be notified at least twenty-four (24) hours prior to the construction of any public, miscellaneous public or industrial well. The well driller is not required to stop work or to wait for Department staff prior to commencing work unless the permit states otherwise. Failure to notify the Department may result in the issuance of an order to abandon the well and/or other action by the Department.~~

~~5.3.4 The outside of all structures that house a public or industrial well, such as a pump house, shall be marked in such a manner so as to indicate that a public or industrial well is contained within the structure~~.

6.3.1 The well owner shall be responsible for posting the Department well identification

number on the exterior of the well enclosure.

6.3.2 All public wells for community water systems and all industrial wells must be logged by a qualified geophysical logging operator. The suite of logs shall include natural gamma, spontaneous potential, and resistivity. Other logs may be required by the Department.

6.3.3 Public wells shall be equipped with a backflow preventer, raw water sample tap, and a pump-to-waste valve on the discharge line of each well prior to the pre-storage isolation valve.

~~5.4~~6.4 Heat Pump Recharge ~~Well Construction~~ Wells

~~5.4.1~~6.4.1 All water obtained from wells ~~for the operation of~~ supplying a heat pump system shall be injected into the source aquifer. ~~from which it came. Exemptions from this requirement may be considered where~~ Where the requirements of ~~Sections 5.4.4~~ Subsections 6.4.4 and ~~5.4.5 of these Regulations~~ 6.4.5 have been met, and the aquifer will not accept the water from the supply well, the Department may approve an alternate method at its discretion.

~~5.4.1.1 the seasonal high static water level in the aquifer from which the withdrawal occurs is within five (5) feet of the land surface, or~~

~~5.4.1.2 the confined aquifer will not accept the water from the supply well~~

~~5.4.2~~6.4.2 No heat pump recharge well may be constructed within ~~fifty (50)~~ 50 feet of any identifiable potential or existing source of contamination. ~~, including but not limited to septic tanks, tile fields, and manure piles~~. Decommissioned septic systems are not a potential or existing source of contamination for heat pump recharge wells.

~~5.4.3 No corrosion inhibitors, water softening, or other additives shall be added to the water that will eventually be returned into the ground.~~

6.4.3 Other than thermal alteration, groundwater recharged to the aquifer shall be in its natural condition.

~~5.4.4~~6.4.4 The diameter and screen length of all heat pump recharge wells shall be equal to or greater than the diameter and screen length of the heat pump supply well, unless otherwise approved by the Department.

~~5.4.5~~6.4.5 Where a heat pump recharge well meets the requirements of ~~5.4.4~~ Subsection 6.4.4 ~~and all other requirements of these Regulations,~~ and the receiving aquifer will not readily accept the return flow, another well will be required. ~~of the owner. In such cases it is the well owner's responsibility to provide for the additional well. An exception to the requirement of another well may be considered upon written request.~~

~~5.4.6 Heat pump recharge wells shall be capped in accordance with the requirements of Section 4.10.2 of these Regulations.~~

~~5.5~~6.5 Heat Pump Closed Loop ~~Well Construction~~ and Direct Exchange (DX) Wells

~~5.5.1~~6.5.1 No heat pump closed loop ~~well~~ or direct exchange wells shall be constructed within ~~fifty (50)~~ 50 feet of any identifiable potential or existing source of contamination. ~~including but not limited to septic tanks, tile fields, and manure piles.~~ Decommissioned septic systems are not a potential or existing source of a contamination for heat pump closed loop or direct exchange wells.

~~5.5.2~~6.5.2 The solution contained in the heat pump closed loop well piping system shall ~~not contain any toxic substances.~~ be free of characteristic hazardous substances with the exception of ethanol-base antifreeze solutions designed for such systems. The use

of non-toxic propylene- glycol-based antifreeze solutions is recommended.

~~5.5.3 The heat pump closed loop well piping system shall comply with the requirements of Section 4.10.3 of these Regulations.~~

~~5.5.4 All buried pipe shall be marked with underground warning tape at a depth of twenty-four(24) inches.~~

~~5.5.5 All closed loop heat pump system piping shall be capped and protected until the manifold piping is ready to be connected.~~

6.5.3 Refrigerant prohibited by the Environmental Protection Agency shall not be used in direct exchange wells.

6.5.4 Prior to being connected to a manifold, the ends of the loop shall be temporarily sealed by fusion or capping. The use of tape is prohibited.

6.5.5 All buried pipe shall be marked with underground warning tape at a depth of 24 inches.

~~5.5.6~~6.5.6 Pressure testing of the closed loop heat pump system network shall be conducted prior to putting the system into operation.

6.6 Miscellaneous Wells

6.6.1 Miscellaneous wells shall be subject to construction conditions as determined by the Department

6.7 Agricultural Wells

6.7.1 Agricultural wells in an area for which a CPCN has been issued shall adhere to the following requirements:

6.7.1.1 The well is not permitted to be used for human consumption;

6.7.1.2 The well is not permitted at any time to be interconnected with any portion of any building's plumbing or any water utility's service connection. The well must be available at any reasonable time for inspection by personnel of the Department pursuant to Subsection 1.2.8 and the water utility serving the certificated area to ensure there are no interconnections.

6.7.2 The well permit shall be subject to revocation upon any violation of the above requirements and, upon revocation, the Secretary shall order that the well be sealed.

~~6.0~~7.0 Well Disinfection

~~6.1~~7.1 General Requirements

~~6.1.1 Disinfection of all wells in accordance with Section 6.2 is required, except as noted in Section 6.1.4 and 6.1.5 of these Regulations. Bacteriological sampling and testing of the well is recommended as the final act of well construction or repair.~~

7.1.1 Disinfection of all newly constructed or repaired wells, in accordance with Subsection 7.2 is required except as noted in Subsections 7.1.6 and 7.1.7.

7.1.1.1 After disinfection of each new, modified, or reconditioned public well, one or more water samples shall be submitted to a certified laboratory for microbiological analysis with satisfactory results reported to the Division of Public Health prior to placing the well into service.

~~6.1.2~~7.1.2 After any repair or maintenance ~~operation~~ to the well, pumping equipment or

piping, or other system components, those ~~system~~ components shall be disinfected. For domestic wells, the entire plumbing system shall be disinfected.

7.1.3 Bacteriological sampling and testing after the repair or maintenance of potable wells is required. Disinfection shall be repeated until bacteriological results meet applicable standards.

~~6.1.3~~7.1.4 Calcium hypochlorite (National Sanitation Foundation/American National Standards Institute (NSF/ANSI) Standard 60 Drinking Water grade or equivalent) shall be used for disinfection ~~of the well and appurtenances, such as the pump, piping and distribution system,~~ unless otherwise approved by the Department.

7.1.5 Continuous disinfection directly into a well while in service is prohibited

~~6.1.4~~7.1.6 ~~No~~ Monitor ~~well~~ wells shall not be disinfected without prior written approval of the Department except for monitor wells used for bacterial sampling.

~~6.1.5~~7.1.7 ~~No~~ Dewatering wells ~~need~~ shall not be disinfected unless specifically required as a condition of the well permit.

~~6.1.6~~7.1.8 ~~The Department shall have the right to require special disinfection procedures~~. The Department may require specific disinfection procedures for deep wells with a higher pH, turbidity, lower temperatures, iron, organic matter, ammonia, or other chemical constituents that interfere with disinfection.

7.1.9 New public wells shall not be put into service until they are tested and approved for use by the Division of Public Health.

~~6.2~~7.2 ~~Required~~ Disinfection Procedures

~~6.2.1~~7.2.1 The following procedures shall be followed when disinfecting wells, unless otherwise approved by the Department: ~~Other methods may be considered provided it can be demonstrated that they will yield comparable results.~~

~~6.2.2~~7.2.2 Calcium hypochlorite ~~tablets~~ (NSF/ANSI Standard 60 Drinking Water grade or equivalent) sufficient for a dosage of at least ~~one hundred (100)~~ 100 milligrams per liter (mg/L) free available chlorine shall be ~~dropped~~ emplaced into the well screen.~~before any pump or pumping equipment are installed. As a general guideline, it is recommended that the dosage calculation be based on two hundred (200) milligrams per liter (mg/L) free available chlorine to account for chlorine demand.~~

~~6.2.3~~7.2.3 After the pump ~~or pumping equipment~~ has been installed, ~~the pump shall be started and water pumped to waste through a discharge line~~, the chlorine solution shall be fed through the entire supply line to waste until chlorine is detected. If the concentration is less than ~~one hundred (100)~~ 100 milligrams per liter (mg/L), more calcium hypochlorite (NSF/ANSI Standard 60 Drinking Water grade) shall be added ~~until the concentration is at least one hundred (100) milligrams per liter (mg/L).~~ to the well until such concentration is reached.

~~6.2.4~~7.2.4 The ~~internal surface~~ inside of the well ~~casing~~ above the static water level shall be ~~rinsed~~ disinfected with the chlorine solution ~~from the discharge line in a manner sufficient to thoroughly rinse the well casing, or for fifteen (15) minutes, whichever is less.~~ for 30 minutes. If granular disinfectant is used, the interior metal surfaces of the well casing above the static water level shall be inspected, and any granules shall be rinsed prior to closing the well.

~~6.2.5~~7.2.5 ~~If it is not practicable to discharge the pumped water back into the well (as described above), fractured calcium hypochlorite tablets (tablets broken into varying sizes ranging from half tablets to a granular size) shall be added to the well. The entire surface of the well casing shall then be rinsed with at least ten (10) gallons of a one hundred (100) milligrams per liter (mg/L) chlorine solution made by dissolving~~

~~calcium hypochlorite (pulverized tablets or granular) in water.~~ If the well is connected to a public distribution system, the chlorinated water shall be pumped to the permanent disinfection unit, if present, or to the end of the water main where it is isolated from the remainder of the distribution system and can be blown off. The well contractor shall coordinate public distribution system disinfection with the Division of Public Health.

~~6.2.6~~7.2.6 If the well is connected to a ~~distribution~~ residential system, the chlorinated water shall be ~~drawn through the entire system until a strong odor of chlorine is detected at each tap,~~ pumped until chlorine is detected at each tap, unless otherwise approved by the Department.

~~6.2.7~~7.2.7 ~~The well and distribution system shall be allowed to stand for at least twelve (12) hours, twenty-four (24) hours is recommended.~~ Disinfectant shall be in contact with the well components and any distribution system components, pursuant to Subsections 7.2.5 and 7.2.6, a minimum of 24 hours, and not to exceed 48 hours.

~~6.2.8~~7.2.8 If the free chlorine residual is less than ~~five (5)~~ five milligrams per liter (mg/L) after ~~twelve (12)~~ 24 hours ~~(using a DPD test kit),~~ the ~~above~~ procedure pursuant to Subsection 7.2.7 shall be repeated. When the free chlorine residual is at least five ~~(5)~~ milligrams per liter (mg/L) after ~~twelve (12)~~ 24 hours, the well and distribution system shall be pumped to waste.

7.2.9 Total chlorine must be absent from the system before collecting the bacteria sample.

~~6.2.9~~7.2.10 Should the well fail to be ~~acceptably~~ disinfected as determined by the Department, the Department may require other measures such as re-disinfection, repair, or ~~abandonment; to be determined on a case-by-case basis.~~sealing.

~~6.2.10~~7.2.11 The amount of calcium hypochlorite needed to produce a dosage of ~~one hundred (100)~~ 100 milligrams per liter (mg/L) free available chlorine per ~~one hundred (100)~~ 100 feet of water column is given in the following table:

~~Calcium Hypochlorite Needed to Dose 100 Feet of Water at 100 mg/L Casing Diameter (Inches) Volume 100 Feet (Gallons) * Calcium Hypochlorite 2 16.3 1/2 oz. 4 65.3 2 oz. 6146.9 4 oz. 8 261.1 6 oz. 10 408.0 8 oz. 12 587.5 12 oz. 16 1,044.5 20oz. 20 1,632.0 2 lb.24 2,350.1 3 lb.~~

~~*65 percent available chlorine~~

Calcium Hypochlorite Needed to Dose 100 Feet of Casing Water at 100 mg/L

Casing Diameter (Inches)	Volume/100 Feet (Gallons)	* Calcium Hypochlorite (Weight)
2	16.3	1/2 oz.
4	65.3	2 oz.
6	146.9	4 oz.
8	261.1	6 oz.
10	408.0	8 oz.
12	587.5	12 oz.
16	1,044.5	20 oz.
20	1,632.0	2 lb.
24	2,350.1	3 lb.

*65 percent available chlorine. The higher the pH, the higher the dosing must be to achieve disinfection

~~6.2.11~~7.2.12 Notes

~~6.2.11.1 READ THE CALCIUM HYPOCHLORITE LABEL CAREFULLY AND FOLLOW ALL SAFETY AND STORAGE INSTRUCTIONS. CALCIUM HYPOCHLORITE SHOULD ALWAYS BE ADDED TO WATER. NEVER ADD WATER TO CALCIUM HYPOCHLORITE.~~

~~6.2.11.2 Prior to closing the well, the interior metal surfaces of the well casing above the static water level should be inspected for fragments of calcium hypochlorite. Any fragments should be removed, as they may corrode the steel well casing and other metal surfaces in the well.~~

7.2.12.1 Read the calcium hypochlorite label carefully and follow all safety and storage instructions. Calcium hypochlorite should always be added to water. Never add water to calcium hypochlorite.

7.2.12.2 The use of calcium hypochlorite warrants strict adherence to all applicable safety measures and utilization of proper protective equipment. The Department assumes no liability attendant to the handling, use and storage of calcium hypochlorite.

~~7.0~~8.0 Well Completion Reports

~~7.1~~8.1 General Requirements

~~7.1.1~~8.1.1 A well completion report and formation log shall be submitted to the Department ~~on forms~~ in a format provided by the Department, not later than ~~thirty (30)~~ 30 days after the construction of any well, except as required in ~~Section 3.11.3 of these Regulations~~ Subsection 3.13.3.

~~7.1.2~~8.1.2 Each completion report shall be signed by the well driller or well driver in direct on-site supervision of the well construction. ~~unless otherwise approved by the Department, certifying that all information contained on the report is true and correct.~~

~~7.1.3 A separate well completion report shall not be required providing all pertinent~~

~~information is supplied on a well abandonment report for the same well.~~

~~7.1.4~~8.1.3 Failure to submit well completion reports as required by this Section shall result in the denial of additional well permits. ~~following written notification to the responsible water well contractor.~~

~~7.2 Required Information~~

~~7.2.1 All items on the well completion report shall be completed, making sure to note if a particular item is not applicable (N/A).~~

8.1.4 The completion report shall include the results of all testing required in the permit.

8.1.5 If geophysical logs were generated, the completion report shall include two copies of each log.

8.1.6 An illegible or incomplete completion report will be returned to the preparer.

~~7.2.2~~8.1.7 If the ~~actual~~ well ~~site~~ location is ~~at all~~ different ~~than~~ from that proposed on the ~~well permit~~application, ~~a~~ the new ~~site plan~~ location shall be ~~included on the well~~ drawn and noted on the completion report. ~~If a site adjustment is made after permit issuance, the well driller or well driver is required to see that the well complies with these Regulations.~~

~~7.2.3~~8.1.8 For wells ~~constructed~~ in unconsolidated sand and gravel aquifers, the well ~~description~~ formation log shall include notation of the ~~sediments~~ sediment type, grain size, ~~(such as gravel, coarse, medium and fine sand, silt, clay, etc.),~~ color, texture, accessory minerals, thickness, and depth of individual layers or lenses, and ~~any characteristics of the sediments that appear different or outstanding.~~ and other distinctive features.

~~7.2.4~~8.1.9 For wells ~~constructed~~ in crystalline rock, the well ~~description~~ formation log shall include the ~~predominant color of the rock, whether or not it breaks easily, whether the rock is veined with stringers of different material or color and any characteristics of the rock that appear different or outstanding. Depth, interval and estimation of flow rate of all water-bearing zones as encountered during drilling shall be specified~~ rock type (such as schist, gneiss, marble), color, hardness, texture, veining, and all other distinctive features, including depth interval, and estimation of flow rate of all water-bearing zones as encountered during drilling.

8.1.10 For non-vertical wells, the angle and direction of drilling shall be noted on the completion report, and a site plan showing the top and bottom of the well included in the report.

~~8.0~~9.0 Well ~~Maintenance~~ and Pump Repair

~~8.1 All materials used in the maintenance, replacement, modification, or repair of any well shall meet the requirements for new installation. Broken, punctured or otherwise defective or unserviceable well casing, well screen, fixtures, seals, or any part of the well head shall be repaired and replaced, or the well shall be properly abandoned and sealed as specified in Section 9 of these Regulations.~~

9.1 All repairs of the internal components of a well shall be performed by or under the direct supervision of a Delaware-licensed well driller or well driver. Repair of pumps, may be performed by a Delaware-licensed pump installer or plumber, except as provided in Subsection 9.2.

9.2 A person owning or leasing land with an agricultural or irrigation well may perform their own pump repair on those wells only.

9.3 The repair of any well must not modify the original construction specifications, except

relining well screens.

~~8.2~~9.4 Repair of any well having a buried well head ~~terminating below ground~~ shall include the ~~extending~~ extension of the well casing above ~~the finished~~ ground ~~surface as specified in Section 4.10 of these Regulations~~ pursuant to Subsection 5.11, unless otherwise approved by the Department.

~~8.3~~9.5 The repair of any industrial, ~~or~~ public, ~~water supply~~ or irrigation well shall include the installation of a water level access port and tube ~~as required in Section 4.11 of these Regulations~~ pursuant to Subsection 5.12, if applicable.

9.6 Well screen relining or changing capacity of the pump for public, irrigation, and industrial wells requires the submission of a new completion report pursuant to Section 8.

~~9.0~~10.0 Well ~~Abandonment~~ Sealing

~~9.1~~10.1 General Requirements

~~9.1.1 The objective of the requirements described in this Section is to seal the well to limit its potential as a pathway for vertical migration of fluids between different aquifers~~.

~~9.1.2~~10.1.1 ~~All wells to be abandoned shall be sealed only by a well driller.~~ The sealing of a well shall be performed only by a Delaware licensed well driller or well driver.

~~9.1.3~~10.1.2 Within ~~thirty (30)~~ 30 days of ~~abandonment~~ the sealing of a well the water well contractor shall submit a well ~~abandonment~~ sealing report to the Department, ~~on a form~~ in a format provided by the Department. The report shall be ~~completely filled out~~ completed and signed by the well driller or well driver ~~in charge of on-site supervision.~~ supervising the site work.

~~9.1.4~~10.1.3 The Department may require any well owner to have a well ~~abandoned~~ properly sealed if the Department determines that any of the following conditions apply:

~~9.1.4.1~~10.1.3.1 The well has been abandoned or determined of no beneficial use~~;~~, ~~or~~

~~9.1.4.2~~10.1.3.2 ~~the well is causing or is a potential source of contamination to waters of the state,~~ The well interferes with the withdrawal of a prior water user unless compensation for such interference is provided to the satisfaction of the Department, or

~~9.1.4.3~~10.1.3.3 ~~the well is producing water that is contaminated,~~ The well is causing or is a potential source of contamination to waters of the state, or

~~9.1.4.4~~10.1.3.4 ~~the operation of the well causes diminishment in the quantity or quality of any neighboring wells or surface waters,~~ The well is having an adverse influence on waters of the State, or

~~9.1.4.5~~10.1.3.5 The well is deemed a potential safety hazard to the ~~lives~~ health and welfare of humans or animals~~;~~, or

~~9.1.4.6~~10.1.3.6 The well is not constructed in accordance with the permit conditions or these Regulations~~;~~ , or

10.1.3.7 The well was installed illegally.

~~9.1.5~~10.1.4 A well ~~penetrating several~~ that interconnects aquifers ~~or formations~~ shall be ~~filled and~~ sealed~~. in such a way as to prevent the vertical movement of water from one aquifer to another within the well~~. unless otherwise approved by the Department.

~~9.1.6~~10.1.5 The Department ~~shall have the right to require special abandonment procedures be followed to avoid or mitigate water quality or water quantity problems~~. may require or approve specific sealing procedures.

10.1.6 The Department may require prior notification of the date of sealing.

~~9.1.7~~10.1.7 ~~All wells for which a replacement well permit has been issued and which are accessible shall be abandoned within sixty (60) days of completion of the replacement well. The well(s) shall be abandoned as set forth in these Regulations unless specific written approval for maintaining the replaced well is granted by the Department.~~ All wells being replaced, with the exception of public wells,shall be sealed within 15 days of completion of the replacement well unless approval for retaining the replaced well is granted by the Department pursuant to Subsection 3.11. Public wells shall be sealed within 30 days of completion of the replacement well.

~~9.1.8~~10.1.8 Wells that are unsuitable for their intended use shall be ~~abandoned~~ sealed pursuant to Subsection 10.3 or ~~converted to another classification~~ reclassified ~~in accordance with Section 3.21 of these Regulations~~ pursuant to Subsection 3.11.

10.1.9 A well will not be considered sealed if only the supply line is sealed.

~~9.2~~10.2 Sealing and Fill Materials

~~9.2.1~~10.2.1 Only concrete, Portland cement, ~~grout~~ sodium-based bentonite clay, ~~grout~~ or combinations of these materials or other materials approved by the Department ~~are considered sealing material and~~ shall be used to ~~abandon~~ seal a well. ~~in accordance with Section 9.3 of these Regulations.~~

~~9.2.2~~10.2.2 Only drill cuttings, clay, silt, sand, gravel, and crusher run are ~~herein~~ considered acceptable fill material and may only be used ~~in the abandonment of a well in accordance with Section 9.3~~ pursuant to Subsections 11.3.6, 11.3.7, or 11.3.8. ~~of these Regulations.~~

~~9.2.3~~10.3.3 Portland cement grout and sodium-based bentonite clay grout shall meet the requirements ~~of Section 4.7.10.1 and 4.7.10.2~~ pursuant to Subsections 5.8.12.1 or 5.8.12.2. ~~of these Regulations.~~

~~9.3~~10.3 ~~Abandonment~~ Sealing Procedures

~~9.3.1~~10.3.1 ~~Prior to abandonment, all wells shall be investigated to determine their condition, the details of construction, and whether or not any obstructions exist that will interfere with the filling and sealing process. Any obstructions shall, if possible, be removed by cleaning out the hole or redrilling.~~ Prior to sealing, the well driller or well driver shall determine the condition of the well, its construction, and obstructions that may interfere with sealing. Obstructions shall either be removed or eliminated through the process of over-drilling, if necessary

10.3.2 Well casing not to be removed shall be cut off at or below grade.

~~9.3.2~~10.3.3 ~~Where the annular space may provide a significant avenue for ground-water contamination or otherwise endanger public health or safety, the Department may require that the well casing be ripped, perforated, or removed entirely to assure that the well casing and annular space or voids are filled with sealing or fill materials. Alternate abandonment procedures may also be approved by the Department.~~ The Department may require that the well casing be ripped, perforated, or removed entirely to ensure that any previously un-grouted annular space or voids are filled with sealing materials.

~~9.3.3~~10.3.4 All wells shall be ~~filled~~ sealed with the appropriate sealing ~~or fill~~ materials by pressure grouting through a tremie pipe ~~starting~~ from the bottom of the well upward to

the ground surface, except as noted in ~~Sections 9.3.6, 9.3.7, and 9.3.8, or~~ Subsections 10.3.6, 10.3.7, or 10.3.8 unless otherwise approved by the Department.

~~9.3.4~~10.3.5 When Portland cement grout or concrete is used as a sealing material, it shall be ~~placed~~ emplaced in one continuous operation until grout returns to the surface.

~~9.3.5 Sealing material shall be placed in the interval or intervals to be sealed by methods that prevent free fall, dilution, or separation of aggregates from cementing materials.~~

~~9.3.6~~10.3.6 A dug well larger than ~~twenty-four (24)~~ 24 inches in diameter shall be filled and sealed by placing fill material in the well to a level approximately five ~~(5)~~ feet below land surface, and placing ~~a three (3) foot plug of~~ sealing material above the fill. ~~The sealing material for the upper portion of the well shall be allowed to spill over into the excavation to form a cap. The remainder of the well shall be backfilled with native soil.~~ The top one foot of the well may be covered with fill material.

~~9.3.7~~10.3.7 For wells penetrating fractured or cavernous rock, coarse fill materials may be used ~~opposite~~ to fill the cavernous ~~or creviced rock~~ portions of the well. ~~Sealing material shall extend to the surface~~ The well shall be sealed from the bottom of the ~~casing or from a depth of twenty (20) feet, whichever is greater.~~ well to the cavernous zone and from the top of the cavernous zone to the land surface.

~~9.3.8~~10.3.8 Dewatering wells and shallow monitoring or observation less than ~~twenty four (24)~~ 20 feet deep and two ~~(2)~~ inches ~~or less~~ in diameter shall have the entire casing removed unless otherwise approved by the Department. After removal of the casing, the wells ~~may~~ shall be ~~abandoned~~ sealed or filled with ~~natural fill materials~~ drill cuttings.

10.3.9 Soil borings or uncased wells less than 20 feet deep shall be sealed or filled with drill cuttings or bentonite or cement grout.

~~10.0~~11.0 Well Identification Tag

~~10.1~~11.1 Upon completion of the well and before leaving the site, the well driller, well driver, or pump installer shall ~~be responsible for the attachment of~~ fasten the well identification tag. ~~issued by the Department. In cases where the well driller will be returning at a later date to hook-up the well, the tag may be secured with a temporary piece of wire or clamping device until after the hook- up has been completed.~~ The tag shall be permanently fastened to the well casing above finished grade by means of a one-half ~~(1/2)~~ or three-eighth ~~(3/8)~~ inch stainless steel band or other device or method approved by the Department. The ~~tags~~ tag for a flush mount ~~installations should be mounted to the sides of the road boxes or by any method which will permanently display the well permit number.~~ installation shall be permanently fastened to the top of the vault lid. The tag for an irrigation well with a concrete pad may be fastened to the pad.

~~10.2~~11.2 The ~~Tags~~ tag for a well ~~permits~~ permit issued ~~via~~ by fax or under emergency circumstances shall be ~~affixed~~ fastened to the well casing within five ~~(5)~~ working days of the well driller's receipt of the tag.

~~10.3~~11.3 Well tags shall be returned to the Department within ~~thirty (30)~~ 30 days of cancellation, revocation, or expiration of an unused permit, or the ~~abandonment~~ sealing of a tagged well.

12.0 Alternative Method of Compliance

When an applicant is unable to meet the design criteria set forth in these Regulations for the siting or construction of a well, the applicant may seek the Secretary's approval for an Alternative Method of Compliance.

12.1 Applicability.

Whenever a well can be constructed in accordance with the requirements of these Regulations that satisfies the applicant's needs, the Department shall require the applicant to construct the well in accordance with these Regulations. An applicant should not seek an Alternative Method of Compliance whenever the applicant can reasonably construct a well that will meet the applicant's needs and that satisfies the requirements of these Regulations.

12.2 Application. An Application for an Alternative Method of Compliance shall consist of:

12.2.1 A complete well permit application;

12.2.2 The appropriate well permit application fee, if applicable, and advertising fee;

12.2.3 A separate scaled plot plan of the area depicting distances from all potential or existing sources of contamination as defined in Section 2.0 of these Regulations, and within the prescribed radius from the proposed well location as described in Section 5.0. The plot plan shall also include all buildings and property lines, and all other physically limiting barriers such as overhead power lines,

12.2.4 A notarized letter executed by the applicant providing explicit documentation supporting the request for an Alternative Method of Compliance.

12.3 Public Notice and Hearing.

12.3.1 Public Notice. Public notice of Applications for an Alternative Method of Compliance shall be made in accordance with 7 Delaware Code, Section 6004. Applications for an Alternative Method of Compliance shall be advertised in a newspaper of general circulation in the county in which the activity is proposed and in a daily newspaper of general circulation throughout the State with a comment period of 15 days.

12.3.1.1 Exceptions to the public notice requirement. The Secretary may take action without public notice on any Application for an Alternative Method of Compliance when the Application concerns:

12.3.1.1.1 Any well from which the Department determines that the withdrawal under normal operations will not exceed 1,000,000 gallons per day; or

12.3.1.1.2 A source of water for three or few families.

12.3.2 Public Hearing. The Secretary shall hold a public hearing on an Application for an Alternative Method of Compliance, in accordance with 7 Delaware Code, Section 6004, if:

12.3.2.1 The Secretary receives a written meritorious request for a hearing within the 15 day public notice period. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the application and a reasoned statement of the probable impact of granting the application; or

12.3.2.2 The Secretary deems a public hearing to be in the best interest of the State.

12.4 Decisions on an Application for an Alternative Method of Compliance.

12.4.1 The Secretary may approve an Alternative Method of Compliance, allowing the applicant to construct a well that otherwise does not meet the design criteria set forth in these Regulations, where:

12.4.1.1 There is no other reasonable source of water available capable of satisfying the applicant's need; and

12.4.1.2 The well, as constructed, will not pose a risk to the lives, health, safety or welfare of those who will use the well, the environment, or to the occupants of this State.

12.4.2 Conditions. The Secretary may include reasonable conditions on the approval and operation of any well authorized to be constructed under this Section. Such conditions may include, but are not limited to, requiring the well to be constructed into a confined aquifer or other alternate depth, special grouting requirements, or monitored for water quality.

12.4.3 The Secretary's decision to approve an Alternative Method of Compliance shall only relieve the applicant from complying with those portions of the Regulations for which the Alternative Method of Compliance was approved. The applicant shall comply with the portions of the Regulations still applicable to approved well. Failure to comply with all applicable regulations and the conditions set forth in the Secretary's approval of the Alternative Method of Compliance shall be grounds to revoke the approval and may form the basis for an enforcement action, pursuant to 7 Delaware Code, Section 6005

~~11.0 Variances~~

~~Applications for variances to any Section of these Regulations, except those which concern a source of water for three or fewer families, shall be advertised in newspapers of local and statewide circulation with a comment period of fifteen (15) days. A public hearing will be held if a meritorious request is received within the fifteen (15) day period. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the application and a reasonable statement of the variance's probable impact.~~

~~11.1 Applicable Delaware Law~~

~~No variance may be granted unless the Secretary, Hearing Officer, or the Environmental Appeals Board finds that the following have been satisfied pursuant to the requirements of 7 *Del.C.* §6011~~

~~11.1.1 Good faith efforts have been made to comply with the requirements of 7 *Del.C.* Ch. 60;~~

~~11.1.2 The applicant is unable to comply with the requirements of 7 *Del.C.* Ch. 60 and these Regulations because the necessary technology or other alternative methods are not or have not been available for a sufficient period of time, or the financial cost of compliance by using available technology is disproportionally high with respect to the benefits which continued operation would bestow on the lives, health, safety and welfare of the occupants of this State and the effects of the variance would not substantially and adversely affect the policy and purposes of this chapter;~~

~~11.1.3 Any available alternative is being or will be used to reduce the impact of the granting of the subject variance on the lives, safety, or welfare of the occupants of this State; and~~

~~11.1.4 The continuing operation of the proposed well is necessary to national security or to the lives, health, safety or welfare of the occupants of this State.~~

~~11.2 Application Procedures~~

~~A separate application shall be made to the Department for each individual well permit desired. Each variance application shall consist of:~~

~~11.2.1 A complete well permit application;~~

~~11.2.2 A separate scaled plot plan of the area depicting distances from all potential or existing sources of contamination as defined in Section 2.42 and 2.53 of these Regulations, within a one hundred fifty (150) foot radius of all proposed public and industrial wells, and within a one hundred (100) foot radius of all other proposed wells. The plot plan shall also include all buildings, and property lines, and all other physically limiting barriers such as overhead power lines;~~

~~11.2.3 The appropriate fee, if applicable;~~

~~11.2.4 Written documentation showing compliance with Section 11.1 of these Regulations.~~

~~11.2.5 The property owner's signature on a written request which specifies the Sections of these Regulations for which the variance is requested.~~

13.0 Variances

Applications for and decisions on a variance request to any Section of these Regulations shall be made in accordance with 7 Delaware Code, Section 6011.

13.1 Notice and Hearing Requirement

13.1.1 The Secretary may, upon application of a person, grant a variance to that person from any requirement of these Regulations after following the notice and hearing procedure set forth in 7 Delaware Code, Section 6004.

13.1.2 Exception to Notice and Hearing Requirement

13.1.2.1 The Secretary may act upon a variance application without public notification where the variance application concerns a source of water for three or fewer families.

13.2 The variance may be granted if the Secretary finds that:

13.2.1 Good faith efforts have been made to comply with 7 Delaware Code, Ch. 60 and these Regulations;

13.2.2 The person applying for the variance is unable to comply with the rules or requirements of either 7 Delaware Code, Ch. 60 or of these Regulations, because the necessary technology or other alternative methods of control are not available or have not been available for a sufficient period of time or the financial cost of compliance by using available technology is disproportionately high with respect to the benefits which continued operation would bestow on the lives, health, safety and welfare of the occupants of this State and the effects of the variance would not substantially and adversely affect the policy and purposes of this chapter;

13.2.3 Any available alternative operating procedure or interim control measures are being or will be used to reduce the impact of such source on the lives, health, safety and/or welfare of the occupants of this State; and

13.2.4 The continued operation of such source is necessary to national security or to the lives, health, safety or welfare of the occupants of this State.

13.3 Variance Application Procedures

A separate variance application shall be made to the Department for each individual well permit desired. Each variance application shall consist of:

13.3.1 A complete well permit application;

13.3.2 A separate scaled plot plan of the area depicting distances from all potential or existing sources of contamination, as defined in Section 2.0 of these Regulations, within a 150 foot radius of all proposed public and industrial wells, and within a 100 foot radius of all other proposed wells. The plot plan shall also include all buildings, property lines, and all other physically limiting barriers such as overhead power lines.

13.3.3 The appropriate well permit application fee, if applicable, and advertising fee.

13.3.4 Written documentation evidencing compliance with Subsection 13.1 and 13.2 of these Regulations and with 7 Delaware Code, Section 6011.

13.3.5 The property owner's signature on the written variance request that specifies the applicable Sections of these Regulations or of 7 Delaware Code, Ch. 60 for which a variance is being sought.

13.4 General Provisions for Variances

13.4.1 The Secretary shall publish his decision, except a decision involving a source of water for three or fewer families, and the nature of the variance, if granted, and the conditions under which it was granted. The variance may be made effective immediately upon publication.

13.4.2 Any party may appeal a decision of the Secretary on a variance request to the Environmental Appeals Board under 7 Delaware Code, Section 6008 within 15 days after the Secretary publishes his decision.

13.4.3 No variance can be in effect longer than 1 year but may be renewed after another hearing pursuant to this section.

13.4.4 The granting of a variance shall not in any way limit any right to proceed against the holder for any violation of the variance. Any rule or requirement of 7 Delaware Code, Ch. 60 or of these Regulations that is not incorporated in the variance provisions shall remain in full effect.

~~12.0~~14.0 Public Hearings and Appeals

~~12.1~~14.1 Any right to ~~Public~~ public hearings shall be held in conformance with the requirements of 7 *Del.C*. ~~§6006~~ Section 6006.

~~12.2~~14.2 ~~Decisions of the Secretary may be appealed to the Environmental Appeals Board pursuant~~ Any right to appeal shall be in conformance to 7 *Del. C*. ~~§6008~~ Section 6008.